Department of Agriculture, Bombay State

Annual Report of the Department of Agriculture in the State of Bombay 1949-50

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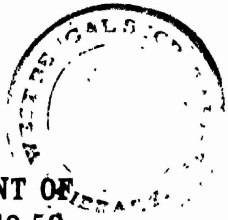

ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE, STATE OF BOMBAY, 1949-50

CHAPTER I

THE AGRICULTURAL YEAR, 1949-50

Climate and Rainfall

1. The agricultural season of 1949-50 was fairly satisfactory over a greater part of the State. The pre-monsoon showers were received in adequate quantities in the Karnatak, Konkan and parts of the Deccan, and facilitated preliminary field operations. The rainfall received in the month of June was below normal almost throughout the State, and *kharif* sowings were accordingly restricted to places where these rains were received in adequate quantities. The precipitation in July was quite adequate throughout the State, except in parts of the Deccan and Karnatak, where more rainfall was needed both for the completion of *kharif* sowings and for promoting the growth of seedlings in areas where early sowings had been done. The rainfall in August was generally below normal. The rainfall in September was quite adequate, but in some parts of the State it was excessive. The heavy rainfall received in September adversely affected grain formation in bajri crops and caused lodging of paddy crops in some places in the Surat district. These rains also hampered interculturing operations and sowing of *rabi* jowar in the Broach district. In the Deccan, the crops which were ready for harvest, were damaged by water-logged conditions in low-lying areas, whilst the young jowar seedlings were washed away in many places in the Sholapur district, necessitating re-sowing of jowar crops. Standing crops also were damaged in the Bijapur district and in places in the Belgaum and Dharwar districts. In the Konkan Division, early sown paddy crops were affected to a varying degree by the heavy rains. The rainfall received in the month of October was generally well distributed, except in North Deccan and the Surat district in Gujarat, where these rains were excessive and proved harmful to the crops. In Khandesh and the Nasik district, bajri, groundnut, jowar and paddy crops were affected by the heavy rains as also paddy crops in the Surat district. Elsewhere in the State, the condition of the *kharif* crop was satisfactory. The rainfall in the month of November was light.

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There was practically no rain in the months of December and January, whilst the rainfall in February was received in quite substantial quantities in the Ahmednagar district in the Deccan and parts of the Karnatak. As a result of the deficiency of rainfall in the Deccan, the outturn of *rabi* crops in the Poona and Sholapur districts was reduced considerably. An intensive cold wave which swept over almost all the districts of the State in the month of February damaged fruit, vegetable, cotton, tobacco, wheat and gram crops to varying degrees in many parts of Gujarat and North Deccan. It also caused considerable damage to mango blossoms in the Ratnagiri district. No damage to crops was reported from the Karnatak. The climatic conditions experienced during the year were conducive to the development of insect pests and plant diseases, which caused damage to the crops.

Agricultural Statistics

2. During the year under report, the statistical work of the Agricultural Department was carried on under three heads, viz., (1) crop cutting experiments, (2) design of experiments and (3) collection, compilation and publication of agricultural statistics. The details of work on the design of experiments are given in Chapter XII entitled 'Miscellaneous Work', whilst those relating to the other two items are given in paras 3 and 6 of this chapter. In addition, a pilot scheme for estimating the additional production of *rabi* jowar in the Poona and Sholapur districts and of wheat in the Nasik district, as a result of the G. M. F. aids was undertaken.

3. *Collection and Compilation of Agricultural Statistics.*— During the year under report, 75 forecast reports on various crops were issued as against 72 such reports in the previous year, the three additional reports being those relating to tobacco crop. Daily and monthly rainfall returns, monthly returns of average retail prices, fortnightly returns of wholesale and retail prices, weekly cotton press returns and monthly ginning returns were compiled for publication in the Bombay Government Gazette. The Season and Crop Report of the Bombay State for the year 1949-50 was prepared and submitted to Government. Information regarding the stocks of cotton held by the cotton traders and the owners of factories as on the 31st August was collected and supplied to the Secretary, Indian Central Cotton Committee. A number of references relating to the improvement of agricultural statistics received from the

Economic and Statistical Adviser, Government of India, were dealt with by the Statistician, Department of Agriculture, Bombay State.

Crop Statistics

4. *Area.*—The table below gives the actual acreages under the more important crops grown in the Bombay State, for the year 1949-50. During the year under report, the area of the Bombay State has considerably increased due to the merger of some of the former Indian States with the Bombay State, and eight new districts have been formed. These are Baroda, Amreli, Mehsana, Banaskantha, Sabarkantha, Satara South, Kolhapur and Dangs. The figures given below refer to the newly constituted Bombay State. The corresponding figures for the preceding year are not given as they relate to the pre-merger Bombay State and hence are not comparable with the figures given below:—

Crop.		Acreage during the year 1949-50.
		acres
Cereals		
Rice	...	3,160,594
Wheat	...	2,079,096
Jowar	...	11,740,910
Bajri	...	6,231,581
Pulses		
Gram	...	894,739
Tur		711,398
Fibres		
Cotton	...	2,490,932
Oilseeds		
Groundnut	...	2,637,369
Sesamum	...	288,998
Linseed	...	67,125
Castor seed	...	116,757
Miscellaneous		
Sugarcane	...	183,750
Tobacco	...	238,431

5. *Production.*—The table below gives the production of the more important crops grown in the Bombay State in the year 1949-50. As in the case of acreages under main crops, the figures of outturn of crops in the preceding year are not given as they relate to the pre-merger period and are accordingly not

comparable with the figures of outturn of crops given in the table below:—

Crop.		Outturn of crops during the year 1949-50.
		tons
Cereals		
Rice	...	1,031,199
Wheat	...	331,403
Jowar	...	1,570,265
Bajri	...	718,210
Pulses		
Gram	...	120,529
Tur	...	153,465
Fibres		
Cotton	...	*592,047 bales
Oilseeds		
Groundnut	...	996,488
Sesamum	...	34,656
Linseed	...	5,382
Castor seed	...	13,884
Miscellaneous		
Sugarcane	...	510,700 (gul)
Tobacco	...	64,153

6. *Crop-cutting Experiments.*—During the year under review, crop-cutting experimental surveys were continued throughout the State on 7 principal crops, viz., paddy, bajri, *kharif* jowar, wheat, *rabi* jowar, cotton and tobacco. Similar surveys were continued on maize, rabi, kodra, groundnut and gram, but these surveys were confined to one district for each crop. In addition, experiments to estimate the average yield per acre of irrigated paddy, irrigated wheat, bajri and *rabi* jowar were continued in the canal tract. In the *kharif* season crop-cutting experimental surveys were carried out on paddy, bajri and *kharif* jowar in the old districts only of the State, but these surveys were extended to the merged areas of the different districts in the following *rabi* season. No experimental surveys could be undertaken in the new districts of the State formed as a result of the merger of the old States with the Bombay State.

* Bale of 392 lbs.

The estimates of the average yields per acre of crops on which crop-cutting surveys have been carried out in the State are given below for the pre-merger Bombay State:—

Crop.		Average yield per acre. lbs.	Sampling error. per cent.
Rice			
Unhusked (paddy)	...	1,176	1.6
Husked (rice)	...	784	1.6
Bajri	...	242	2.6
Kharif jowar	...	503	3.3
Rabi jowar	...	222	4.4
Wheat	...	333	2.4
Cotton (kapas)	...	216	3.7
Tobacco	...	561	4.6

On comparing the revenue estimates of the total production in the Bombay State with the estimates based on the experimental surveys, it was found that the revenue estimates of the total production of *kharif* jowar and cotton were lower by 13 and 17 per cent, respectively, than the corresponding sample estimates, whilst the revenue estimates in respect of the total production of rice, bajri and wheat were over-estimates to the extent of 4 per cent, 10 per cent and 8 per cent, respectively. In the case of *rabi* jowar, the two estimates for the State agree, but they differ widely for some of the individual districts.

The estimated yields per acre of crops on which crop-cutting surveys were conducted in one district each are given as under:—

Crop.		Average yield per acre. lbs.	Sampling error. per cent
Maize	...	753	6.4
Rabi	...	485	4.3
Kodra	...	871	6.2
Groundnut	...	424	5.4
Gram	...	214	5.5

The estimated yields per acre of crops on which crop-cutting experimental surveys were conducted in the canal tract, are given as under:—

Crop.		verage yield per acre. lbs.
Paddy	...	938
Bajri	...	244
Wheat	...	735
Rabi jowar	...	543

The results of the crop-cutting experiments carried out during the year under review were utilised for framing yield forecasts of crops for the districts in which these experiments were conducted. For the remaining districts, outturns of crops were based on the *annawari* and the standard yields of crops reported by the Revenue Department.

Crop Prices

7. The condition of the rural population was much the same as in the previous year, except in Gujarat, where the condition of the cultivators was much better than in the preceding year when scarcity conditions prevailed. The prices of food and commercial crops continued to be high, but this advantage was counter-balanced by the increased cost of cultivation. With the general upward trend of prices, the cultivators were required to pay more for the agricultural requisites and for their own maintenance. Detailed information regarding fluctuations in the prices of important agricultural commodities during the year under report is given in Chapter V of the Season and Crop Report of the Bombay State, 1949-50, and is not repeated in this Report.

Agricultural Legislation

8. The Bombay Cotton Control Act, 1942, continued to be in force in the Dharwar-Kumpta Cotton Protected Area. In order to meet the persistent demand of the growers of cotton in Khandesh, the restrictions imposed by the Cotton Control Act of 1942 for growing Jarila cotton in the Khandesh Protected Area were removed during the year under review. The Cotton Transport Act continued to be in force in all the three cotton tracts, viz., Gujarat, Khandesh and Karnatak.

The Bombay Growth of Food Crops Act, 1944, continued to be in force, but its application was restricted to the sugar factory areas in so far as the growing of foodcrops was concerned, and the tobacco growing areas in the districts of Kaira, Satara, Belgaum, Sangli and Kolhapur. This Act was not applied to the cultivation of cotton in the State, and this resulted in the extension of the area under cotton cultivation during the year.

CHAPTER II

Soil and Irrigation Research

9. *Introduction.*—Research work on important problems relating to the soil, conservation of soil moisture and irrigation of crops is carried on at the Dry Farming Research Station, Sholapur, and at the Agricultural Research Station, Padegaon.

A. Sugarcane Research Station, Deccan Canals, Padegaon

10. As the Bombay Sugarcane Research Scheme had not been finally approved by the Indian Central Sugarcane Committee, work at the Agricultural Research Station, Padegaon, was extended for a further period of 6 months until it was taken over by the Committee. In anticipation of the sanction of the Indian Central Sugarcane Committee to the Bombay Sugarcane Research Scheme, Government appointed, in November, 1949, the Sugarcane Specialist to undertake research work in accordance with the programme of work approved under the scheme. Government made this arrangement in order to ensure that there was no break in the continuity of the research work being carried on at Padegaon. The sanction of the Indian Central Sugarcane Committee to the Bombay Sugarcane Research Scheme for a period of five years has been received, and arrangements for transferring the research work at Padegaon to the scheme will now be made.

Research work at the Agricultural Research Station, Padegaon, is carried on in different sections. In the Soil Physics Section, long-term experiments have been continued to study the effects of irrigation, manuring, cropping and fallowing on the soil. Soil analysis studies have shown that there is a progressive decline in the quantity of calcium carbonate and available phosphate in the soil in those plots which have been receiving increasing doses of irrigation water. Generally speaking, no harmful effects of continuous irrigation for the last 17 years have been observed. On the contrary, there has been increase in the nitrogen and humus contents of the soil under continuous irrigation. Plots treated with farmyard manure have shown the highest quantities of nitrogen, humus and available $P_2 O_5$ in the soils. The replacement of P. O. J. 2878 variety of cane by Co. 419 variety, has resulted in high yields of cane in medium and light soils, while in *chopan* soils, the yields of the two varieties are almost equal. The cultivation of cane year after year in the same soil has resulted in reduced yields as compared to

the plots in which leguminous and non-leguminous crops were grown in rotation with cane. In the Crop Physiology Section, investigations on determining the manurial requirements of pre-seasonal (October) plantings of cane have been continued. These experiments have shown increasing yields of cane with increasing doses of nitrogen. The application of phosphates to cane grown in rotation with sann-hemp has given very promising results in all types of soil, including F type, which did not show any response to phosphatic manuring in the previous years. The increase in yield in plots to which phosphatic manures were applied was due to the larger number of canes produced in the plot. In the case of paddy crop, the highest yield was obtained when 192 lb. of nitrogen was applied to the crop. In the Agronomy Section, replicated trials of different cane varieties were continued. The value of a basal application of compost in obtaining the best results from the use of artificial fertilisers as top dressing was also confirmed. Complex field experiments on irrigation and manuring were further continued. In the Insect Pests Section, studies on the bionomics of insect pests affecting sweet potatoes, sugarcane and jowar were continued.

11. *Sub-Stations of the Agricultural Research Station, Deccan Canals, Padegaon.*—In addition to the existing sub-stations in the Deccan Canals area, two more sub-stations have been established, one at Alnavar in the Karnatak, and the other at Vyara in Gujarat. The experimental work at these sub-stations consists mainly of the irrigational and manurial requirements of sugarcane and trial of suitable cane varieties under different conditions of soil-climate complex with a view to evolving cropping systems suitable for the different soil types.

12. *Gul Research.*—As stated in the last report, research work on the improvement of the quality of *gul* has been closed down, but some laboratory work in this connexion has been continued in Poona during the year under review. The use of activated carbon in improving the colour of *gul* has already been reported, and further work on filtering *gul* juices through filter press has been done and has given promising results. It was discovered that the liquefaction of *gul* during the monsoon was caused by micro-organisms and that the products of decomposition were more hygroscopic than the original samples of *gul*. Attempts were accordingly made to preserve *gul* by incorporating into it various preservatives, such as benzoic acid, salicylic acid, boric acid, sulphur, thymol, etc. The samples of

gul so prepared were kept at Karjat during the monsoon. All samples of *gul* into which the preservatives were incorporated, had better keeping quality than those without the preservatives.

13. *Genetic Soil Survey Scheme.*—Work on the genetic soil survey and classification of land under sugarcane on the Deccan Canals now forms part of the programme of work under the Sugarcane Development Scheme. About 25,000 acres of land belonging to the sugarcane growers (*bagaitdars*) was surveyed on the Nira and Godavari Canals.

B. Dry Farming Research Station, Sholapur

14. The rainfall during the year under report was much above the normal, and accordingly the *kharif* crops, excepting the tur crop, suffered due to excessive moisture in the soil. The *rabi* crops, however, did fairly well under the Bombay Dry Farming System of cultivation. Results of tillage experiments confirmed the finding that ploughing as part of the Bombay Dry Farming System was in no way superior to harrowing. It was also found that there was scope for economising on the cost of cultivation of crops by reducing the number of harrowings and interculturings if these operations were carried out at proper time. The application of manganese sulphate to the groundnut crop increased its yield by 25 per cent at Sholapur, whilst at Chas, zinc sulphate, when applied to gram crop, increased its yield by 53 per cent. Work on contour strip cropping was carried out at six centres distributed in the scarcity districts of Sholapur, Ahmednagar, Satara, Bijapur, Dharwar and Belgaum. The problems investigated related to the selection of erosion-resisting crops, seed rates of these crops, determination of suitable widths of erosion-resisting strips of cover crops, trial of grasses on bunds for stabilization, changes in soil fertility due to contour strip cropping, etc. Jowar and bajri crops, when grown in rotation with groundnut, hulga (*Dolichos biflorus*) and matki (*Phaseolus aconitifolius*), have given substantially increased yields at different centres. Strips of matki of 24 ft. width and sown with 5 times the normal seed rate per acre, proved most effective in the prevention of soil erosion. Of the grasses tried for the purpose of prevention of soil erosion, *marvel* (*Dicanthium nodosum*) and blue *panic* (*Panicum antidotale*) were very promising. Blue panic grass produced an extensive root system in the top 9″ layer of the soil, which is very fertile and most susceptible to erosion.

15. *Reclamation of 'karl' (alkali) soils.*—In the agronomical trials conducted in the *karl* soils at Kanginhal and Nargund, in the Dharwar district, *rabi* jowar sown 18" apart with a seed rate of 8 lbs. per acre gave the best results with only 2 interculturings, whilst cotton did well with a wider spacing of 30". The application of sulphur and farmyard manure to the *karl* soils considerably improved soil structure and the absorptive power of the soil Examination of soil profiles at both these Stations revealed that the normal fertile soil has a black layer extending to a considerable depth, whilst in the degraded soil, the depth of the black soil is considerably diminished, thereby exposing accumulation zones of calcium carbonate and soluble salts. Contour bunding and contour cultivation in these soils help to check their further deterioration and facilitate proper absorption of rain water, resulting in increased crop yields. Some preliminary work has recently been undertaken on the saline soils of Gujarat at Harij, in the Mehsana district.

The survey and classification of lands under the Lift Irrigation Schemes were carried out during the year under report. Thirteen projects were surveyed covering a total area of 23,730 acres The land was divided into 6 classes according to a system of classification based on the examination of soil profiles and chemical analysis of the soil.

CHAPTER III

Botanical Research

I. Crop Breeding

16. *Introduction*—A comprehensive programme of botanical work on the improvement of food and non-food crops has been undertaken by the Agricultural Department Improved strains of cereals, pulses, oilseeds, cotton and tobacco have been evolved and are being multiplied for distribution among the cultivators. Work on a new scheme for research on tuber crops, which is partly financed by the Indian Council of Agricultural Research, was undertaken during the year under review at the Cereal Breeding Station, Niphad.

17. *Departmental Crop Breeding and Agronomy Committee.*—The Committee held two meetings during the year under report and discussed several botanical and agronomical subjects. As stated in the last report, a Special Agronomy Committee of the Agricultural Department has been set up for the purpose

of scrutinizing all agronomical experiments to be undertaken by the Agricultural Department. This Committee held one meeting during the year under review.

A. Cotton

18. *Gujarat: Cotton Breeding Work at Surat.*—Further trials were conducted with strains 77-2 and 3652 in the districts and showed that strain 77-2 was suitable for wilt-free areas and strain 3652 for those areas where the wilt disease was quite common. Strain 3652 gives higher spinning value than 1027 A. L. F. on account of its fibre fineness, although its staple length is slightly shorter than that of Suyog. Further trials will be continued with a view to determining the relative merits of these two strains for replacing Suyog. As regards the wilt-resistant strains which are being evolved at Shera, strain 2087 seems to be very promising for yield and wilt resistance. Further research work will be devoted to improving the staple length of the wilt resistant, high ginning and fine-fibred strain 3652 by crossing it with long staple cottons.

19. *Gujarat: Cotton Breeding Scheme at Broach.*—The object of the scheme, which is financed by the Indian Central Cotton Committee, is to improve the staple length of Vijay and introduce earliness into this cotton in order to escape frost. Two promising wilt resistant segregates from crosses with 1027 A. L. F., viz., 66 and 98 have been obtained and are being tried on the Surat Farm and on the cultivators' fields, together with strains 3652 and 2334 evolved at the Surat Farm. One very early strain, viz., 22 gave significantly higher yield than Vijay, but it has lower ginning percentage than the latter. Further selection in this strain is being continued.

20. *Gujarat: Cotton Breeding Scheme, Viramgam.*—This scheme is partly financed by the Indian Central Cotton Committee. The object of this scheme is to improve further the quality of Kalyan cotton and to introduce into this cotton early maturity in order to escape frost. A number of segregates from different crosses are being tried.

21. *Gujarat: Scheme for the Improvement of Mathio Cotton at Amreli.*—This scheme is also partly financed by the Indian Central Cotton Committee. As a result of the past work, an improved strain called Pratap has been evolved. The object of this scheme is to improve the staple of Pratap by crossing it with long staple *arboreum* cottons from Madras and with high ginning strain C. 520.

22. *Gujarat*: *Scheme for Research in Interspecific Hybridisation of Cotton, Surat.*—The object of this scheme, which is financed by the Indian Central Cotton Committee, is to explore the possibility of cotton improvement by interspecific hybridisation between American and Asiatic cottons. Selection in the fertile hybrids from the crosses between American and Asiatic cottons has given types which have desirable characters of high ginning and/or staple length. The selected material is being tried under rainfed conditions at Surat, in the Dharwar-American cotton area at Gadag, and under irrigated conditions in the Deccan Canals tract.

23. *Khandesh*: *Cotton Breeding Scheme, Jalgaon.*—This scheme is partly financed by the Indian Central Cotton Committee. Selection for staple length and fibre fineness is being continued in the improved strain 197-3. Strain 197-3 has also been crossed with fine, long staple cottons, and the work is still in an early stage.

24. *Southern Division*: *Cotton Breeding Scheme at Dharwar and Gadag.*—Two new improved strains, viz., Jayadhar for the Kumpta cotton area and Laxmi for the Dharwar-American area have been evolved and are being multiplied. Further work on the crosses between K. F. T. 12-2-5 and improved types of *herbaceum* cottons from Gujarat has been undertaken, and there are prospects of obtaining better types of cotton than Jayadhar. Similarly, crosses have been made between improved types of Dharwar-American cottons and other strains from Madras with a view to obtaining a type of cotton superior to Laxmi. A scheme for the botanical improvement of Kumpta cotton for the eastern tract of the Bombay-Karnatak has been sanctioned by the Indian Central Cotton Committee.

25. *Poona*: *Scheme for Breeding Wilt Immune Varieties of Cotton.*—This scheme is financed by the Indian Central Cotton Committee for co-operative research by the Plant Pathologist to Government and the Cotton Breeders in the main cotton-growing tracts of the Bombay State with a view to evolving strains immune or highly resistant to wilt disease. In the Broach Section of the scheme, some highly wilt-resistant progenies have been obtained from the cross (1027 A. L. F.×B. C. 1-2) and its back-cross B. C. 1-2. In the Surat Section, some good material has also been obtained from the crosses (8-1×B. C. 1-6) and (1027 A. L. F.×B. C. 1-6). In the Jalgaon Section, progenies of Dokras 9-2-8-3 and two families of the cross (670× Dokras) continued to be promising. In the Dharwar Section,

some progenies of the cross (K. F. × R), the back-cross (K. F. × Jarila) × K. F. and cultures of Jayadhar proved completely resistant to wilt disease.

26. *Deccan: Trials of Long Staple Cotton in the Deccan Canals Tract.*—The object of these trials is to try out long staple American cottons in the Deccan Canals tract with a view to finding out suitable strains for general cultivation in this area. Co. 4 has been tried and again found suitable for general cultivation in this area. Trials of some of the interspecific hybrid strains from Surat have also given encouraging results as compared to Co. 4.

B. Rice

27. *Deccan and North Konkan: Rice Breeding Work at Karjat, Panvel, Vadgaon, Igatpuri, Padegaon and Nawapur.*—As a result of trials conducted on the Karjat Farm during the last three years, strains Garvel 1-8, a late, coarse rice; Mahadi 8-2 and 4-4, early, coarse, red rices, and E. K. 70, an early, fine Kolpi rice, have proved their superiority, and arrangements are now being made for conducting trials in the Thana and Kolaba districts. Segregates from crosses made with the object of improving the standard strains evolved at Karjat were also studied. Attempts are also being made to evolve blast-resistant strains of paddy. Three Zinya selections, viz., late Zinya 14 and mid-late Zinya 3 and 48 are also being tried in the Thana district. At Panvel, two salt-land rices, viz., strains Kala Rata 1-24 and Bhura Rata 4-10 have proved superior to the local. The sweet-land rices from Karjat, viz., K-42 and Z-149 seem to possess considerable saline resistance. Material of crosses between salt-land paddy varieties and sweet-land rices from Karjat was under study. At Vadgaon, selections have been made among the Dodak and Tansal varieties of rice. Some of the late, scented strains of rice imported from other States gave higher yields than the local Ambemohor types. Two Varangal selections seem to be promising. Ambemohor strains evolved at Vadgaon did well when grown at Igatpuri. Early Kolpi-70 strain gave, on an average, 22 per cent higher yield than the local in trials conducted for five years. At Padegaon, selection work in Dodki variety is in progress. This work has now been transferred to Kopergaon. At Nawapur, selection work among the local varieties has been continued.

28. *South Konkan: Rice Breeding Work at Ratnagiri, Phonda Ghat, Chiplun, Kumta and Kagal.*—At Ratnagiri and

Kumta, botanical work is now devoted to the improvement of the standard strains of rice by crossing them with other improved strains, since re-selection in the standard strains has not given any promising results. Four selections, viz., Bileakka 303, Dodda Pandya 496, Sannamaliga 79 and Sanna Pandya 478 were found to be superior to the local in trials conducted at Kumta; these strains are suitable for general cultivation in the Karwar-Ankola area of the Kanara district. As stated in the last report, selections have been made among the local varieties, viz., Lavesal, Sonfal, Mugda and Bela at Phonda Ghat; among Bhadas, Panvel, Vanksal and Valai varieties at Chiplun and among Arya, Karekagga and Bilekagga varieties at Kagal. This work is still in an early stage. A new station has been established at Jagalbet with the object of improving the varieties of rice grown in the upghat areas of the North Kanara district. Blast-resistant varieties of rice have been imported from Madras for trial and for crossing with the local varieties with a view to evolving suitable blast-resistant strains for cultivation. Selection work has been undertaken among local varieties, viz., Sorta, Devakarda, Mullare, etc.

29. *Karnatak*: *Rice Breeding Work at Mugad.*—In trials conducted at the farm, some rice strains imported from Madras have given higher yield than D. 622. It is proposed to conduct further trials with the Madras strains for yield and for resistance to blast disease. Two purple-leaf rice strains seem to be promising. Segregates from crosses between standard strains and other strains possessing desirable agricultural characters, were studied during the year both in respect of yield and resistance to blast disease.

30. *Gujarat*: *Rice Breeding Work at Bulsar, Nawagam and Derol.*—At Bulsar, Kada selections 176-12 and 288 were found to be significantly superior to Kada 68-1 (Karjat) and the local Kada. Red Kada selection 10-3 and Wankwel 39-35-23 were also found to be superior to the local. An early Kolam strain 61 has been selected and is found to be superior to the local. It matures in 95 days and is suitable for growing between cotton rows in Gujarat. 'Human Victory', a variety imported from Japan, has a compact ear and has been used for crossing with local strains. Thirteen Spanish varieties of rice with long compact ears were also tried, but they were later maturing and produced smaller number of tillers than Kada. At Nawagam, promising selections among the Sukhavel, Sutarsal (early), Jirasal and Pankhari varieties are available. Crosses have been

made between promising selections of local varieties and the quality strains. Crosses of Jirasal with Kamod and Basmati 370 were also under study. At Derol, selection work was continued in the Sathi, Sariu and Dudhani varieties.

C. Wheat

31. *Deccan: Wheat Breeding Work at Niphad, Padegaon, Jalgaon, Shahada, Puntamba, Kopergaon and Mohol.*—At Niphad, rust-resistant segregates from crosses between Niphad 4 and exotic wheats were multiplied both in the *kharif* and *rabi* seasons. Crosses have also been made between the standard strains and the rust-resistant durum strain, viz., Gaza, in order to evolve rust-resistant strains suitable for cultivation under dry conditions. Promising selections among the irrigated wheats, viz., Baxi and Mondhya were tested for yield, and some of these have been found to be quite outstanding. Selection work among the Wagia and Chandusi wheats grown in Gujarat was continued. The Australian wheat, S. S. Cilevana, reputed for its high yield, was tested out in comparative trials with irrigated and dry wheats of Niphad. In these trials, the Niphad wheats were found to be superior to the Australian wheat. Twelve N. P. wheat strains were tried with Niphad 4 and Vijay, but they did not prove superior to the latter. At Shahada and Puntamba, selection work in wheat has been undertaken. Rust-resistant strains of wheat evolved at Niphad were also tried at these places for their performance under local conditions. Promising selections made in the irrigated wheats at Padegaon have been transferred to Kopergaon for further study.

32. *Karnatak: Wheat Breeding Work at Bijapur, Bailhongal and Annigeri.*—At Bijapur, 4 promising selections made in the local red-hard wheat were further tested. Some of these selections have been crossed with the exotic rust-resistant variety, viz., Gaza. Selection work in wheat was continued at Bailhongal and Annigeri. Rust-resistant wheats from Niphad were tried at these places. The Australian wheat S. S. Cilevana was compared with the local wheats at Annigeri, but was found to be late-maturing as well as low-yielding. Crosses have been made between Gaza and the local wheats at Annigeri.

33. *Gujarat: Wheat Breeding Work at Arnej and Bhuwa.*—At Arnej, the best selections in Dhola Katha and Rata Katha wheats of the Bhal tract were further tested out in large-scale trials. Selection 206 in Dhola Katha and selection 624 in Rata Katha have consistently given higher yields than the local varieties. Selection work in the Bara and Wagia varieties was continued At Bhuwa, wheat breeding work was continued.

D. *Jowar*

34. *Deccan: Jowar Breeding Work at Padegaon, Jalgaon, Karad, Shahada, Puntamba and Kopergaon.*—At Jalgaon, selection work in the *kharif* jowar varieties, viz., Aispuri, Satpani, Godgariya and Changdeo was continued. At Karad, similar work in the varieties Argud and Gidgyap was in progress. Promising selections for striga resistance have also been made in the crosses between M-35-1 and Bonganhills and Argad and Bonganhills. At Padegaon, some promising selections in the Dagdi and Maldandi varieties were tested out on the farm.

35. *Karnatak: Jowar Breeding Work at Mohol, Bijapur, Nipani, Bailhongal and Annigeri.*—At Mohol, the best selections in the Maldandi, Dagdi and Bedari varieties were further tried. The trial of fodder jowars was also continued. At Bijapur, trials of the promising selections in the Maldandi and Gund varieties of jowar were continued. Material of crosses of M-35-1 and M-47-3 with other fodder varieties of jowar was further studied. At Nipani, selection 89 in the Gidgyap variety was found to be very promising. At Bailhongal, selection work was continued in the *kharif* jowars, and similar work was continued in both the *kharif* and *rabi* jowars at Annigeri.

36. *Gujarat: Jowar Breeding Work at Bhuwa.*—Selection work has been undertaken in the local *rabi* jowar at Bhuwa. In a trial conducted at the farm, N. D. 15 and B. D. 8 varieties were found to do well.

E. *Other Cereals*

37. *Bajri Breeding Work at Niphad, Puntamba, Karad and Boriavi.*—Mass selections work in the three well-known local varieties of bajri, viz., Khandalwadi, Savargaon and Dahiwadi, was continued at Niphad. Bajri strain 28-15 proved to be the most promising in a large-scale trial conducted with 6 local strains of bajri and 2 types from Madras. The improved strain gave 30 per cent higher yield than Akola bajri. Preliminary selection work has been undertaken in the local bajri at Puntamba. Improved strains of bajri evolved at Niphad and Boriavi, viz., L. M.-38-39, AF_3, 28-15 and B. 207 were compared in randomised replications with the local bajri from Akola and Puntamba. Strains L. M.-38-39 and 28-15 were superior to the local. Bajri breeding work at Boriavi has now been transferred to the Agricultural School, Baroda. Selection for bold seed in the improved strain B.207 was continued. Bajri breeding work at Karad was continued.

38. *Maize Breeding Work at Dohad and Arbhavi.*—At Dohad, 8 groups of inbreds of maize were maintained. Twelve single hybrid combinations were made and were found to be superior to Sumeri maize. Of the 19 exotic hybrids tested, V. L.5 hybrid gave slightly higher yield than Sumeri maize in row trials. At Arbhavi, inbreds of the different varieties of maize were maintained by selfing and by sib pollination. The two farm hybrids and four new hybrids were compared with the local. The two farm hybrids and two new hybrids were found to be superior to the local in yield both in the *kharif* and *rabi* seasons. Twenty exotic hybrids of maize were compared with 7 farm hybrids, and 4 exotic hybrids proved to be better than the farm hybrids in yield but not in quality of the grain. Similarly, 22 double hybrids of maize were compared with 5 farm hybrids and the local in replicated trials.

39. *Small Millets.*—At Hatkhamba, two early selections of nagli, viz., 28-1 and 50-1 gave, on an average, higher yield than the standard strain B-11, in trials conducted for two years. At Igatpuri, selection 47 gave higher yield than all the improved strains in the Bombay State. Selections 47 and 23 are now being given further trial in the Nasik district. At Vadgaon and Karjat, selections were made in the fresh material collected in the Poona and Kolaba districts and in the Maval area. At Boriavi, selections 154-2, 220-1, 96-3, 50-2 and 47-1 proved superior to the local in trials conducted for four years. In the district trials, selection 47-1 gave higher yield than the local at 8 out of 12 places, the increase in yield being 10 to 20 per cent more than the local. As regards kodra, two kodra selections and 1 kodri (small grained) selection gave, on an average, 13 to 15 per cent higher yield than the local in trials conducted at Hatkhamba for three years. Selection work in the varieties of kodra grown in Khandesh has been undertaken at Boriavi. Selection 80-2 was found to give good performance in trials conducted in the Kaira district. The late vari selection 13-11 gave 21 per cent higher yield in trials conducted at Hatkhamba. Two rala (*Sctaria italica*) selections, viz., 30-1 and 31-1 gave, on an average, higher yield than the local by 16 per cent in trials conducted at Niphad for four years.

F. *Tobacco*

40. *Tobacco Breeding Work at Boriavi and Nipani.*—The main lines of work at these research stations consist of the evolution of high-yielding strains of *bidi* tobacco of superior quality. The research station at Nipani is also concerned with

botanical work on cigarette tobacco. At Boriavi, improved strains of tobacco have been evolved which give 10 to 15 per cent higher yield than their respective locals. These strains are Keliu 49, Saijpuriu 57 and Gandiu 6. A strain P.19 of the Piliu variety, which is well-known for its quality and ripens early, has recently been evolved and has been found to give higher yield than the local Piliu by 9 per cent. Crosses of K-49 with the high-yielding cigarette types are also under study. The research work at Nipani is financed by the Indian Central Tobacco Committee. As a result of past work, two improved strains, viz., S-20-2 and S-12-5 of *bidi* tobacco have been evolved and are now being tried in the district. Among the Virginia tobacco varieties, Harrison Special and Bonanza have been found to give higher yield and their leaf is of the requisite quality after flue curing. Crosses of *bidi* tobacco with cigarette tobacco are also under study. The exploratory work of growing cigarette tobacco at Vijapur, in the Mehsana district, was financed by the Indian Central Tobacco Committee. It has been found that cigarette tobacco can successfully be grown at Vijapur and that it is more profitable to grow cigarette tobacco than *bidi* tobacco. The Indian Leaf Tobacco Development Company Ltd. has undertaken the work of curing cigarette tobacco and purchase of the produce of the farmers at Vijapur.

G. *Other Crops*

41. *Oilseeds.*—(*i*) At Kopergaon, the Spanish Improved strain of groundnut was found to be superior to the local, as reported last year. The seed of this strain is being multiplied for distribution among the cultivators in the Deccan Canals area. At Mohol, Pondichery-8 strain gave higher yield than Big Japan. Selection work has been undertaken in groundnut at Dohad, Shahada, Karad, Mohol and Bailhongal.

(*ii*) Selection work among the sesamum varieties was continued at Boriavi, Shahada, Niphad and Puntamba. At Dohad, strain Niphad-85 of sesamum was found to be superior to the local in yield, whilst the local variety gave higher yield than Niphad-85 in trials conducted at Bhuwa, in the Broach district.

(*iii*) At Niphad, selection work in safflower was continued. Three best cultures were compared with Niphad-630 in trials conducted during the year. All the cultures gave higher yield than Niphad-630 and also had higher oil-content. At Karad, some promising cultures from the Deccan and Karnatak were tried in small tests on the farm. At Annigeri, in the Dharwar

district, and at Bailhongal, in the Belgaum district, selection work was also continued in safflower.

(*iv*) Selection work in niger was continued at Puntamba and at Niphad. In a replicated test at Dharwar, selections A and B proved superior to the local in trials conducted for four years; strain B was superior to strain A. Similar trials conducted at Bijapur and Kopergaon showed the superiority of strain B over strain A and the local. The seed of strain B is being multiplied for distribution.

(*v*) At Niphad, 7 crosses were under study with the object of increasing the yield of the improved strains.

(*vi*) The improved strains S-20 and 85 were maintained in a pure condition and multiplied at Boriavi for distribution among the cultivators. At Annigeri, S-20 gave higher yield than the local.

42. *Pulses.*—Work on the botanical improvement of pulses is carried on under the Pulse Research Scheme partly financed by the Indian Council of Agricultural Research and the Scheme for Improvement of Cereals (other than rice), Pulse and Oilseed Crops in the Bombay State. Both the *kharif* and *rabi* pulses are being studied at the different stations in the State.

(*i*) At Niphad, selections made in Chafa gram for bold grain were further tested out on the farm. Selection work in gram was continued at Shahada, Puntamba and Karad. At Shahada and Karad, 4 best cultures selected from the strains evolved at Poona were further tried. Selection Chafa 1-1-4 was found to be superior to the standard strain Chafa. In a trial of promising selections conducted at Dharwar, three wilt-resistant selections were found to be particularly promising. Selection work is also being continued at Annigeri. Two strains, viz., National Pusa and G-24 imported from the Punjab were tried, but were found to be late-maturing. Strain G-24 is wilt-resistant, and attempts are being made to cross this strain with the local material for introducing the wilt-resistant character into the latter. The study of the crosses made at Bailhongal is being continued.

(*ii*) At Arbhavi, 10 selections of tur seem to combine high yield with wilt-resistance. Wilt-resistant selections from Arbhavi were tried out at Bhuwa, Puntamba, Annigeri and Shahada. At Bhuwa, selection S. T. 15-15 from Boriavi gave the highest yield, but there was no significant difference in the yield of this strain and the local in tests conducted at Puntamba. At Arnej and Shahada, both the strains proved inferior to

the local. Breeding work in tur has been discontinued at Bailhongal as this place is not suitable for this work. Selection work in tur is being continued at Annigeri and Mohol. Two superior strains of tur, viz., Kanpur 139 and Khandesh 136-6, have been evolved at Kopergaon. At Boriavi, 11 promising selections have been made, and most of these selections are superior to the local. Selection 15-15 has given consistently higher yield than the local.

(*iii*) Both at Jalgaon and Annigeri, work on mug could not be continued during the year under report as the crops were badly diseased.

(*iv*) The crops at Jalgaon and Karad were affected by disease, and breeding work in udid could not be continued during the year under report.

(*v*) District trials of improved types of matki were conducted during the year. Promising selections of matki were tried at Boriavi, Shahada, Jalgaon, Mohol and Annigeri, in order to determine their suitability for cultivation at these places.

(*vi*) Selection work in kulthi was continued at Bailhongal. Six best selections of kulthi made on the Dharwar farm were tried at Bailhongal and found to be promising. Selection among the kulthi varieties of Khandesh was continued at Shahada.

(*vii*) Crosses were made at Karjat between four improved strains of *wal* (*Dolichos lablab*) and the mosaic-resistant strain from Bulsar. Some promising selections of *wal* were tested out at Bulsar, and selection 125 was found to be consistently superior to the local both in point of yield and its resistance to the mosaic disease. At Igatpuri, a few promising selections of white and red *wal* were tested out during the year under report.

(*viii*) Work on the further improvement of wilt-resistant strain of lang was continued at Bhuwa.

(*ix*) Selection work was continued in field peas and lentils at Igatpuri.

43. At Devihosur, selection 80-1 of chilli was found to give consistently better performance than the local, although the fruit of this selection is not as lustrous as that of the local. The improved Deccan types, viz., C-2 and C-9, though giving as good yields as the local, were not suitable as they were not in demand in the local market. At Nipani, three Sankeshwar selections, viz., 20, 22 and 32 were found to be significantly superior to the local.

44. *Agave* (*Sisal*).—The work on the sisal was closed down during the year.

H. *Vegetable Crops*

45. Work on the botanical improvement of vegetable and tuber crops was continued at the College of Agriculture, Poona, and the Crop Breeding Station, Niphad. At Poona, selection work was continued in *bhendi*. In addition, replicated yield trials were conducted on *padval, guwar,* tomato, French beans, brinjal, carrot, lettuce and raddish. At Niphad, work on the varieties and selections of sweet potatoes transferred from Padegaon, 14 varieties of sweet potatoes received from Dr. Boshi Sen, the White Star variety received from the U.S.A. and four fresh collections of sweet potatoes, was continued. Of the four varieties of sweet potatoes received from Dr. Boshi Sen, varieties 7-13-4001 and 6-B-219 were found to be promising. The local improved strains of sweet potatoes, viz., C. L. 44 and B-2 were further tried and multiplied. A large number of red and white onion selections were grown at Niphad. Several types, including the male sterile and disease-resistant types received from California, were planted for production of seed. Trial of eight Simla hybrids of potatoes received from the Head of the Economic Botany Section, Indian Agricultural Research Institute, New Delhi, was carried out in the Poona district. None of these hybrids proved superior to the *Numbri* variety of potatoes.

I. *Grasses and Forage Crops*

46. *Botanical Work on Grasses and Forage Crops.*—Scientific research work on grasses has shown that the marvel grass belongs to three botanical species. Individual selections of promising types within each species have been made. Yield trial of nine exotic grasses showed that *Setaria* sp., Guinea grass and thin Napier grass gave higher yields than *marvel*. Among wild legumes, a few selections have been made in Barbada (*Indigofera glandulosa*) and Shevra (*Alisicarpus rugosus* and *A. pubescens*), which have got a longer period of vegetative growth. Acclimatisation trials of grasses were carried out at eleven Agricultural Schools with a view to determining the suitability of the grasses for cultivation in different areas.

47. *Provincial Fodder and Grazing Committee.*—No meeting of this Committee was held during the year under report.

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WEST BENGAL SECRETARIAT

48. *Departmental Grassland and Fodder Committee.*—This Committee held two meetings when the questions of utilisation of waste lands for the growing of perennial grasses and other fodder plants, the collection and cleaning of grass seeds, the use of grasses and legumes for soil conservation and the possibility of introducing ley farming in some areas of the State were discussed.

II. General Botanical Work

49. The study of the nutritional requirements of the rice plant both in pot and water cultures was continued at Karjat. Similar work on wheat was carried out at the College of Agriculture, Poona.

Encouraging results have been obtained in investigations on the prevention of fruit drop in mango, the production of parthenocarpic fruits in bottle-gourd and on hastening the ripening of fruits by the use of plant hormones. Stimulation of seed germination and increase in yield were obtained by treatment of wheat and gram seed with very low concentrations of 2, 4-D.

A valuable collection of wild plants closely related to cereal, pulse and oilseed crops has been made and is being maintained for future use in hybridisation work on the evolution of new types of plants. A triploid wheat has been synthesized by crossing a diploid wheat with a tetraploid wheat in connexion with the studies on the development of wheats resistant to rust.

Government have appointed a Fibre Development Officer with a view to exploring possibilities of growing jute and its substitutes, e. g., ambadi (*Hibiscus cannabinus*), *Urena* sp., *Malachra* sp., *Abutilon* sp. and *Sida* sp. in the Bombay State.

The scheme for investigating the nutritive value of improved strains of foodcrops, etc., was continued.

CHAPTER IV

Crop Protection

50. *Departmental Insect Pest and Plant Disease Committee.*—This Committee held three meetings during the year under report and dealt with subjects pertaining to research and development work on the prevention and control of insect pests and plant diseases of crops.

A. *Research Work*

51. *Research Work on Crop Diseases.*—The Plant Pathologist to Government has, as in the past, carried out a comprehensive programme of research work on the methods of prevention, eradication and control of important diseases of crops. Some of the investigations on crop diseases are financed by the Indian Council of Agricultural Research, the Indian Central Cotton Committee and the Sir Sassoon David Trust Fund.

52. *Plant Virus Research Scheme.*—This scheme is financed by the Indian Council of Agricultural Research and deals with the study of fundamental nature of plant viruses and of virus diseases of crop plants. Steps were taken to control the yellow vein-mosaic of *bhendi* in a radius of three miles from the College of Agriculture, Poona, by establishing a 'close season' for the cultivation of *bhendi* in this area. After the 'close season,' the *bhendi* crop planted in this area suffered from the disease to the extent of only 3 per cent. Similar measures were taken for the control of 'katte' disease of cardamom in a block of 100 acres of garden area in the Sirsi taluka of the North Kanara district. The results were very encouraging. A scheme for extending similar operations over the entire cardamom area in the North Kanara district has been submitted to Government. Mosaic disease of papaya has appeared in a virulent form in the Poona district and it is proposed to apply the Insect Pest and Plant Disease Act to the affected area. Bunchy top disease of banana was observed in Khandesh and the Poona and Surat districts.

53. *Wheat Rust Research Scheme.*—Strain 88, the seed of which was received from the Indian Agricultural Research Institute, New Delhi, for testing in the Bombay State, was found to be highly resistant to 10 races of black stem rust occurring in India. N. P. 710 and N. P. 715 were found to be rust-tolerant. Charter, Gabo, Inmillo and H. R. Spring strains of wheat were found to be resistant to rust.

54. *Scheme for Breeding Wilt-Resistant Varieties of Cotton.*—This scheme is financed by the Indian Central Cotton Committee. Progenies of hybrid selections of the cross (1027 A.L.F. × B.C. 1-2) and of its back-cross to B.C. 1-2 showed high degree of wilt-resistance. Progenies of Dokras 9-2-8-3 and 2 families of (670-4 × Dokras) were also found to be promising for wilt-resistance. Some progenies of the cross (K. F. × Jarilla) × K. F. and cultures of Jayadhar remained almost free from wilt infection in pot culture tests.

55. *Bacterial Diseases of Plants.*—Moderate to heavy infection of Jarilla, Dokras, Gaorani and 197-3 cottons was noticed in trials conducted at Jalgaon. Leaf-spot diseases of alfalfa and chillies, which are caused by bacterial pathogens, have been observed and are new to this country. A thermophillic bacterial organism (98°C.) has been isolated from rotting tomatoes and onions. Leaf-spots of castor, *Begonia* and tur have also been recorded.

56. *Striga Research Scheme.*—Some families from the crosses between the exotic varieties of Bonganhilo and Burma Y. K. and some of the local jowar varieties have consistently shown resistance of 80 per cent to *Striga* attack.

57. *Miscellaneous Research Work on Plant Diseases.*—(*a*) *Cotton Root Rot.*—Experiments for controlling cotton root rot by growing *Phaseolus aconitifolius* between the rows of cotton plants were continued during the year under report.

(*b*) *Blast Disease of Rice.*—Three strains received from Coimbatore, viz., 39-12, 38-92 and 38-40, and Bhadas variety maintained their resistance to blast disease in trials conducted during the year. K. 42 and Bhangarkaddi varieties were highly susceptible to the disease. Spraying of rice seedlings in seedbeds with perenox (1½ lb. in 50 gallons of water) and dipping the rice seedlings in the spray material before transplanting considerably reduced infection by the disease.

(*c*) *Seedling Blight of Wheat.*—T. M. T. D. Spergon, A. A. grano and sulphur were used for treatment of wheat seed in the control of seedling blight. The first two fungicides not only effectively controlled seedling blight but improved the stand of the wheat crop.

(*d*) *Nematodes in Piper longum.*—Killoptera D. D. and methyl bromide, when injected into the infested soil at the rate of 10 ml. per foot, effectively controlled nematode infection of plants.

(*e*) *Rust of Sugarcane.*—A new rust of sugarcane has been discovered, and it is named *Puccinia sacchari.* Sugarcane variety Co. 475 is susceptible to this rust.

(*f*) *Verticillium Wilt in Brinjal.*—Improved New York, Round Black and All Season Round varieties of brinjal were found resistant to *Verticillium* in pot culture tests.

(*g*) *Tur Wilt.*—Selection M. 7-7 and M. 7-4 showed high degree of resistance to tur wilt in pot culture tests.

(*h*) *Gram Wilt.*—Selections in Dohad-1 and Nagpur 352-4 varieties of gram were very promising for resistance to wilt.

58. *Research Work on Insect Pests.*—The Agricultural Entomologist to Government has carried out investigations into a number of insect pests of important garden and field crops. Some of these investigations were financed by the Indian Council of Agricultural Research.

59. *Biological Control of Sugarcane Borers.*—Work on the control of sugarcane borers by the parasitization of the pest by *Trichogramma*, was continued. In 6 out of 14 observations, the percentage reduction of stem-borer population was actually more in the control than in the treated plots. In the remaining plots, the treated plots had, on an average, 19.3 per cent less borer population than the control. This was not statistically significant. However, the percentage of parasitization of the stem-borer eggs was significantly higher in the treated plots than in the control. The yields of cane in the treated plots were, on an average, higher than in control plots. Sugarcane variety Co.421 was the least susceptible to the borer attack.

60. *Kane Pest of Rice at Kumta.*—Treatment of rice plants with DDT and BHC dusts was continued with a view to confirming their efficacy in the control of *kane* pest.

61. *Pests of Safflower.*—Pyrocolloid (1 lb. in 1,000 lb. of water) effectively controlled aphis infection. Two to three sprayings of pyrocolloid given at weekly intervals during the latter half of December or early in January were necessary for effective control. The cost of each treatment was Rs. 10 to Rs. 12 per acre. As a result of this treatment, the yield of the crop was increased, resulting in a net profit of Rs. 10 per acre. The leaf-eating caterpillars were found to be serious on safflower crops round about Dharwar, Belgaum and Bijapur.

62. *Investigations on Stored Grain Pests, Bombay.*—It was found that empty gunnies, when sun-dried for a week and disinfected with Pyrodust or fumigated with E.D./C.T., proved very useful in controlling the pests of grains filled in these bags. Pyrethrum in the form of Pyrocolloid was effective in killing *khapra* grubs in the godowns. Recent trials have shown that gas-proof covers can be effectively used for fumigation of grain bags. Methyl bromide can be recommended for fumigation on a large scale, but for fumigation on a small scale, E.D./C.T. was quite suitable. Magnesium oxide, an inert substance, when mixed with grain at the rate of 1 lb. in 1,000 lb. of

the grain, kept out the insect pests without affecting the germination of the grains.

63. *DDT and BHC Schemes.*—The Deccan Wingless grasshopper can be effectively controlled by dusting the young hoppers with 10 per cent BHC. About 20-25 lb. of the dust will be sufficient for one application. The cost of the treatment comes to Rs. 8 to Rs. 10 per application per acre. Mixtures of 5 per cent DDT and sulphur in the proportions of 1:1, 1:3 and 1:5 were used to dust mango blossoms for the control of hoppers. The first two mixtures, viz., 1:1 and 1:3 gave complete control of the hoppers. The residual effect of the treatment in the case of 1:1 mixture was more than 15 days, and that of 1:3 mixture was less than 10 days. Two applications of 1:1 mixture were sufficient to control hopper infection, whereas three applications of 1:3 mixture were required for effective control. The treatment with 1:1 mixture was cheaper than the dusting with 1:3 mixture.

64. *Other Insect Pests.*—(*a*) Preliminary trials with pyrocolloid and pyrodust were undertaken against the rice butterfly caterpillar and the pumpkin beetle. Pyrodust 4000 gave 85 per cent to 90 per cent mortality of the red pumpkin beetle in field trials. Further work is in progress.

(*b*) Trials with zinc phosphide for the control of field rats were conducted at Poona. Zinc phosphide was found to be much more effective than barium carbonate in killing rats.

(*c*) Preliminary trials with a new insecticide, "Parathion E", in the strength of 1:2000 showed that the insecticide was quite effective in controlling the white fly and its nymphs.

(*d*) Laboratory trials with pyrocolloid and DDT emulsions gave encouraging results in the control of hairy caterpillar (*katra*).

B. *Extension and Development Work*

65. In addition to research work, the Plant Pathologist to Government and the Agricultural Entomologist to Government dealt with a large number of enquiries from the public pertaining to plant diseases and insect pests of crops and their methods of control. A number of plants and plant products meant for export to foreign countries were examined in Bombay and certificates regarding the freedom of these consignments from injurious insect pests and diseases were issued.

The scheme for the organisation of the Crop Protection Service in the Bombay State was continued during the year under

report. Insecticides, fungicides and appliances were made available to the growers for dealing with outbreaks of insect pests and plant diseases.

A scheme for the control of the Deccan Wingless grasshopper was sanctioned by Government. Under this scheme, 53,000 acres of jowar crop were dusted with 10 per cent gammexane, which was supplied to the cultivators at a subsidised rate. A similar scheme for the control of the rice grasshopper was undertaken in the Belgaum district. An area of 23,000 acres of paddy crop was dusted with 5 per cent gammexane for the control of the grasshopper. The insecticide was supplied to the growers at one-third the cost price.

An intensive campaign for the control of sugarcane grasshopper was carried out under the Sugarcane Development Scheme. Of the total area of 3,721 acres affected with this pest, 3,012 acres were successfully treated with 5 per cent gammexane.

CHAPTER V

Seed Supply

66. *Introduction.*—Work of multiplication and distribution of improved seed of crops continued to engage the attention of the Agricultural Department during the year under report. Improved seeds of paddy, bajri, jowar, wheat, maize and gram were multiplied for distribution. This work was extended to the merged areas. During the year under report, 1,68,503 maunds of improved seed was stocked and distributed to cover an area of 35,89,898 acres. Additional production of foodgrains from this area was estimated at 23,40,089 maunds. The Indian Central Cotton Committee continued to finance the schemes for the multiplication and distribution of seed of improved strains of cotton in the different cotton-growing areas of the State.

A. *Cotton Seed Distribution*

67. *Khandesh: Jarilla Cotton Seed Multiplication and Distribution Scheme.*—This scheme is financed by the Indian Central Cotton Committee. The total area under Jarilla cotton in the year under report was 2,27,185 acres. The quantity of nuclear seed of Jarilla produced was 24, 302 lbs., which was supplied to the registered seed-growers for further multiplication. The area organised by the Agricultural Department in the different stages of seed multiplication was 32,616 acres, and the

seed collected from this area for distribution during the 1950-51 season was 20,33,260 lbs. The multiplication and marketing of Jarilla cotton is being done with the assistance of the co-operative organisations in Khandesh. A quantity of 47,884 lbs. of the seed of improved strain 197-3 was given to the selected cultivators for further multiplication, and it is expected that sufficient seed for sowing an area of about 20,000 acres will be obtained from this area. The scheme for the multiplication and distribution of the improved strain 197-3 in Khandesh was sanctioned by the Indian Central Cotton Committee.

68. *Gujarat*: (*a-1*) *Suyog Cotton Seed Multiplication and Distribution Scheme in the Surat Area.*—This scheme is financed by the Indian Central Cotton Committee. During the year under report, 74,526 acres were organised by the Agricultural Department. The quantity of pure seed of Suyog stocked and distributed was 23,34,870 lbs. The scheme has now been extended to the former Rajpipla State, which has merged with the Bombay State.

69. *Gujarat*: (*a-2*) *1027 A.L.F. Cotton Seed Multiplication and Distribution Scheme in Nawapur Taluka of the West Khandesh District.*—This scheme is financed by the Indian Central Cotton Committee. During the year under review, an area of 3,509 acres was organised under 1027 A.L.F. cotton by the Agricultural Department. About 1,50,569 lbs. of 1027 A.L.F. cotton seed was stocked and distributed. The whole area in the Nawapur taluka suitable for cotton cultivation is now under 1027 A.L.F.

70. *Gujarat*: (*b*) *Vijay Cotton Seed Multiplication and Distribution Scheme in Middle Gujarat.*—The scheme is financed by the Indian Central Cotton Committee. The total area under Vijay cotton (excluding the Baroda State) was 3,08,270 acres, of which the Agricultural Department controlled an area of 34,790 acres, including an area of 1,208 acres sown with pedigree seed. The total quantity of seed of Vijay cotton distributed in the Broach, Kaira and Sabarkantha districts was 11,01,255 lbs., of which 7,17,255 lbs. were distributed by the Agricultural Department and the remaining quantity through the Co-operative Cotton Sale Societies. The number of full-pressed bales from the controlled area was 11,497.

The total area under Vijay cotton in the Baroda district was 3,25,000 acres, of which 41,624 acres were organised under the control of the Agricultural Department. The quantity of seed distributed by the State Department of Agriculture was

19,82,400 lbs., while the quantity of seed distributed by approved merchants was 5,59,080 lbs. The number of 'Agmarked' bales of cotton from the controlled area was 13,751. As recommended by the Indian Central Cotton Committee, the scheme for the multiplication and distribution of Vijay cotton in the Baroda State has now been amalgamated with a similar scheme for Middle Gujarat.

71. *Gujarat*: (c) *Kalyan Cotton Seed Multiplication and Distribution Scheme in North Gujarat.*—This scheme is partly financed by the Indian Central Cotton Committee. During the year under report, the area under Kalyan cotton was 34,025 acres and it is expected that about 13,72,350 lbs. of cotton seed will be available from this area to cover 70,000 acres in the 1950-51 season. A similar scheme for the multiplication and distribution of Kalyan cotton in the Mehsana district of the former Baroda State was in operation during the year under report. The area under Kalyan cotton in the Mehsana district was 1,370 acres out of the total area of 75,000 acres under cotton in the district. It is hoped to cover an area of 25,000 acres in the 1950-51 season with the cotton seed available from the controlled area in the Mehsana district and the seed to be imported from the Ahmedabad district for distribution. The Kalyan Cotton Seed Distribution Scheme in the Mehsana district has now been amalgamated with the Scheme for Multiplication and Distribution of Kaylan cotton seed in North Gujarat.

72. *Karnatak*: *Jayawant and Gadag No. 1 Cotton Seed Multiplication and Distribution Scheme.*—This scheme is financed by the Indian Central Cotton Committee. The total area under Jaywant and Jayadhar cottons was 5,05,322 acres and 17,222 acres, respectively. The area under Gadag No. 1 and Laxmi cottons was 1,52,037 acres and 6,756 acres, respectively. The premia realised for Jayadhar and Laxmi cottons ranged from Rs. 40 to Rs. 80 per *nag* (1,344 lbs.) for Jayadhar cotton and Rs. 200 to Rs. 250 per *nag* for Laxmi cotton, more than the premia for the graded *kapas* of Jaywant and Gadag No. 1, respectively. About 1,110 bales of Jayadhar cotton were ginned and pressed under the supervision of the Agricultural Department, and certificates in respect of purity of the cotton were issued by the departmental staff.

B. *Rice Seed Distribution*

73. The schemes for the multiplication and distribution of improved paddy seed in the Dharwar and Belgaum districts

and in the North Konkan districts of Thana, Bombay Suburban and Kolaba were continued. Similar schemes for the transplanted areas of the Ratnagiri district and the drilled tract of the North Kanara district were continued during the year under report. The scheme for the multiplication and distribution of improved seed of paddy in the Poona and Satara districts was also continued. Work under the scheme for the multiplication and distribution of improved paddy seed in the transplanted areas of the North Kanara district was undertaken during the year. In all, 1,08,075 maunds of paddy seed was stocked and distributed in the State, covering an area of 4,12,258 acres. The additional production of paddy from this area was 7,64,400 maunds. During the year under report, 1,430 maunds of nuclear seed was produced on the different rice breeding stations for further multiplication on the fields of registered seed growers.

C. *Millets (Jowar and Bajri) Seed Distribution*

74. The schemes for the multiplication and distribution of Nadiad bajri No. 207 in the Ahmedabad and Kaira districts and of Akola bajri and *rabi* jowar M-35-1 in the Deccan and Karnatak were continued. During the year under report, 8,620 maunds of bajri seed was distributed to cover an area of 85,856 acres. The additional production of bajri from this area was 25,783 maunds. Improved bajri seed was multiplied in compact blocks, and the seed from the inner zones of these blocks was supplied to the cultivators for sowing. About 46,966 maunds of *rabi* jowar (M-35-1) seed was distributed to cover an area of 30,77,229 acres, resulting in an additional production of 15,34,804 maunds of jowar grain. About 26,314 maunds of bajri seed and 11,908 maunds of jowar seed were purchased and stored for distribution in the next year. About 107 maunds of Nadiad bajri No. 207 seed and 880 maunds of jowar seed were produced on the Government seed farms for further multiplication on the fields of registered seed growers.

D. *Wheat Seed Distribution*

75. About 2,195 maunds of improved wheat seed was distributed in the Deccan and Karnatak to cover an area of 2,212 acres. The additional production from this area was 1,800 maunds of grain. The quantity of improved wheat seed produced on the Government seed farms was 950 maunds. About 674 maunds of improved wheat seed was purchased from the cultivators for distribution in the next year.

E. *Distribution of Seed of Other Crops*

76. (*i*) *Maize Seed Distribution.*—Under the scheme for the multiplication and distribution of Sumeri maize in the Panchmahals district, about 2,203 maunds of seed was distributed to cover an area of 8,811 acres. The additional production of maize from this area was 8,811 maunds. About 6,932 maunds of Sumeri maize seed was purchased during the year for distribution in the following season, and 65 maunds of maize seed was produced on the Government farms for further multiplication.

(*ii*) *Nagli Seed Distribution.*—About 444 maunds of nagli seed was distributed to cover an area of 3,532 acres, resulting in an additional production of 5,298 maunds of grain. During the year, 394 maunds of nagli seed was purchased for distribution in the following year.

(*iii*) *Gram Seed Distribution.*—About 4,519 maunds of *Chafa* gram seed was distributed during the year to cover an area of 9,504 acres. The additional production from this area was 6,760 maunds of gram. About 1,838 maunds of *Chafa* gram seed was purchased for distribution in the following year, and 600 maunds of seed was produced on the Government seed farms for further multiplication.

77. *Seed Supply in Famine and Scarcity Tracts.*—Arrangements were made for the supply of seed of paddy, bajri, maize, *kharif* jowar, *rabi* jowar, wheat and gram to cultivators in Gujarat, since there were not sufficient quantities of seed available to the cultivators in this area due to the scarcity conditions prevailing in the previous year. With the exception of the bajri crop in the East Khandesh and Nasik districts and the paddy crop in the Kaira, Dangs, Sabarkantha and South Satara districts, both the *kharif* and *rabi* crops during the 1949-50 season were, on the whole, quite satisfactory in the State. Accordingly, the cultivators were able to keep their own seed for sowing in the following season. Government had, however, made arrangements for the selection of seed from the Government godowns for supply to the needy cultivators in the next year if there was any demand for it.

78. *Hot Weather Foodcrops Campaign.*—The subsidy of Rs. 15 per acre for encouraging the growing of irrigated foodcrops in the hot weather during the year 1949 was continued. The Collectors of the districts paid Rs. 10,054 as subsidy to the growers, who sold to Government 1,200 maunds of grain produced during the hot weather at the controlled rates.

79. *Sugarcane Seed Distribution.*—Under the Sugarcane Development Scheme, 112 seed nurseries have been established in the Deccan Canals area and in the Karnatak, for the multiplication of improved varieties of cane, viz., Co. 419 and Co. 475. During the year under report, 7,40,650 three-budded setts of cane equivalent to 5,406 maunds of sugarcane were supplied to the sugar factories and the registered seed growers.

CHAPTER VI

MANURES

80. *Compost Manure in Rural Areas.*—Under the scheme for the preparation of compost manure in the rural areas, about 3,43,280 tons of compost manure was distributed to the cultivators to cover an area of about 68,658 acres. The estimated additional production from this area was 7,356 tons of grain.

81. *Compost Manure from Town Refuse.*—Under this scheme, the staff of 114 municipalities was trained in the methods of preparing compost manure from town refuse. Eighty-four municipalities have commenced preparing compost manure. During the year under review, about 1,65,818 tons of compost manure was prepared, and 1,36,756 tons of compost manure sufficient to manure an area of about 27,351 acres was distributed. The additional production from the manured area was estimated at 2,930 tons of foodgrains.

82. *Scheme for the Improvement of Farmyard Manure.*—Under this scheme, 20,927 pits were filled up, and the quantity of manure expected from these pits was 52,319 tons.

83. *Cattle Dung in the Bombay Suburban Area.*—The scheme for the utilisation of cattle dung manure lying waste in the Bombay Suburban area was continued during the year under report. It was proposed to transport and utilise 35,500 tons of the cattle dung manure for application to foodcrops, but 29,930 tons of the manure was actually transported and distributed in the districts of Surat, Thana, Nasik, East Khandesh, West Khandesh and Poona. A similar scheme for the utilisation of cow dung manure lying waste in the West Khandesh district was undertaken during the year. A quantity of 1,500 tons of manure was collected, and of this quantity, 1,074 tons of manure was distributed and used for manuring foodcrops.

The target quantity of 3,000 tons of manure could not be collected as the scheme was undertaken late in the monsoon.

84. *Groundnut Cake.*—About 44,164 tons of groundnut cake was supplied to cultivators at subsidised rates for manuring paddy and irrigated wheat and jowar crops. The area manured with groundnut cake was 2,36,458 acres, and the additional production expected from this area was 25,387 tons of foodgrains.

85. *Manure Mixture.*—In addition to groundnut cake, 35,622 tons of manure mixture containing 8 parts of groundnut cake, 2 parts of sulphate of ammonia and 1 part of bonemeal, was prepared and distributed at subsidised rates to cultivators for manuring paddy and irrigated wheat and jowar. The area manured was 2,73,576 acres, and the estimated additional production was 30,383 tons of foodgrains.

86. *Potato Manure Mixture.*—Under the scheme for the preparation of potato manure mixture, a special mixture containing 14 parts of groundnut cake, 37 parts of sulphate of ammonia, 43 parts of superphosphate and 6 parts of bonemeal was prepared, and 4,613 tons of this mixture was distributed at cost price to the potato growers. The quantity of potato manure mixture distributed was sufficient to fertilise 13,840 acres of land, and the additional production of potatoes from this area was estimated at 12,360 tons.

CHAPTER VII

HORTICULTURE

87. *Departmental Fruit and Vegetable Committee.*—This Committee held one meeting during the year under report and discussed subjects relating to research and development work in horticulture.

A. *Horticultural Research*

88. *Ganeshkhind Fruit Experiment Station, Kirgee.*—Observations on the influence of the different kinds of citrus rootstocks on the productivity and vigour of the scions were continued. It was confirmed that *jamburi* and *sharbati* lemon

stocks were the best from the point of view of resistance to mottle-leaf disease, which is caused by lack of zinc in the soil. Similarly, it was confirmed that chiku plants propagated by 'layering' were superior to those grafted on *rayan* (*Mimusops hexandra*). Some of the chiku plants grafted on *rayan*, which had developed chlorosis in the previous year, were restored to their normal condition by injecting ferrous citrate into their stems. The experiment on the spacing and training of grape vines on wire trellis was continued. An experiment for determining the size and age of suckers of *basrai* bananas at planting time for obtaining the maximum yield of the crop in the shortest time, was undertaken during the year.

B. *Horticultural Extension and Development*

89. During the year under report, the Government of Bombay were authorised to carry out the enforcement of the Fruit Products Order of 1948. According to this Order, the Assistant Horticulturist, Post-War Reconstruction, was appointed Inspector of Fruit Products in addition to his own duties. He inspected the premises of 66 manufacturers of fruit products in the State, and 46 manufacturers were granted licences for the manufacture of these products. A fruit products laboratory has been established at the College of Agriculture, Poona, for determining the purity of the samples collected by the Inspector of Fruit Products from the different factories.

90. *Establishment of Fruit Nurseries.*—Five Central Fruit nurseries established at Puntamba, Kumta, Dharwar, Ratnagiri and Kosbad and three Subsidiary Fruit nurseries established at Borgaon, Dhulia and Arbhavi, in 1947, continued to function successfully. About 1,32,600 fruit plants were raised at these nurseries for distribution among the growers. One more Subsidiary Fruit nursery was established at Bagalkot during the year under report. Proposals for establishing three more fruit nurseries—one each at Kolad, Kolhapur and Nasik—are under the consideration of Government. The number of coconut seedlings raised at the coconut nurseries at Kumta and Kosbad was 6,520 and 2,905, respectively. These nurseries are becoming very popular with the growers.

91. *District Fruit Crop Survey.*—A survey of the banana-growing areas of the East Khandesh district was made with a view to collecting information on the local practices of cultivation and manuring in order to determine whether any improvements were required to be effected in these methods.

92. *District Propaganda and Advisory Work.*—The campaign for the side-grafting of mango trees and budding of *bor* trees was continued during the year under report, and 1,483 mango trees were side-grafted and 1,437 *bor* trees were budded *in situ.* The virus disease of papaya continued to cause considerable damage to the papaya crop in the Poona and Thana districts. The area under banana in the East Khandesh and Surat districts was also reduced to some extent due to the prevalence of the 'Bunchy Top' disease of bananas. The growers were trained to identify the diseased trees in the initial stages of attack so that the affected trees may be destroyed before they become a source of danger to other healthy trees in the orchard. About 15 lbs. of seed of Washington papaya was distributed to the growers. About 1,000 grafts of guava Lucknow-49 were produced at the Ganeshkhind Fruit Experiment Station, Kirkee, and distributed among the growers. The citrus growers in the Ahmednagar and East Khandesh districts were advised to spray the mosambi trees in their gardens with zinc sulphate as curative of the mottle-leaf disease.

C. *Horticultural Education*

93. In the Horticultural Training Class at the Ganeshkhind Fruit Experiment Station, Kirkee, 29 students were trained during the year. Of these students, 4 students belonged to the Backward Classes.

During the year under report, a fortnightly course in fruit preservation was organised at the College of Agriculture, Poona. Over 100 women students were trained in this class during the period from the 1st January to the 30th June, 1950. It is proposed to organise another short course in gardening for ladies.

CHAPTER VIII

Agricultural Engineering

94. *Introduction.*—The Agricultural Engineer to Government deals with all research work on the agricultural engineering problems. He is also responsible for the supervision of departmental plants and buildings and gives advice and assistance to the cultivators in the purchase, maintenance and repairs to power plants, etc., used for agricultural purposes. The

Mechanical Cultivation Section is entrusted with the work of mechanical cultivation of lands infested with deep-rooted weeds. It also undertakes shallow and deep ploughing of cultivators' fields in connexion with the 'Grow More Food' Campaign.

95. *Research Work on Agricultural Engineering.*—No research work on agricultural engineering problems could be undertaken by the Agricultural Engineer to Government as he was fully occupied with the manufacture of Musto Patent Power Boring machines. Twenty-four such machines were manufactured during the year 1948-49, and work on another 24 machines was undertaken during the year under report. In addition, 50 sweet potato slicing machines were manufactured. Thirty-six winnowing fans and 1 wheat thresher were also manufactured and supplied to the departmental institutions and cultivators.

96. *Extension Work.*—Several enquiries on agricultural engineering problems were received from the cultivators and dealt with promptly. One hundred and fifty-five sites were surveyed for boring, and estimates were prepared for 230 power plants. Seventy-one power plants were installed and 148 power pumping plants were inspected and necessary advice was given to the owners of these plants.

97. *Special Schemes worked by the Agricultural Engineering Section:*—(*i*) *Well Boring.*—There are now 54 power boring machines working in the State. These include 25 Ideco Power Boring machines purchased last year, 24 Musto Patent Power Boring machines manufactured during the previous year and 2 Bucyrus Erric Rigs received from the former Baroda State. The 24 Musto Patent Power Boring machines manufactured last year are not yet complete with all the tools, the receipt of which is awaited from the U. S. A. Some of the power boring machines given to the District Local Boards and the Collectors of districts in Gujarat for scarcity areas last year were withdrawn and allotted to other districts. According to the revised rates, cultivators are now required to pay only 50 per cent of the estimated cost of boring, the remaining cost being borne by Government as subsidy. During the year under report, 106 bores were taken in the different districts of the State, and the total footage of work done was 9,232 feet. Sixty-nine bores were sunk by the District Local Boards of Ahmedabad and Kaira districts, and the footage of work done was 11,331 feet.

(*ii*) *Hire and Sale of Machinery.*—Engines, pumps, boring machines, etc., were given out on hire, and the total receipts realised amounted to Rs. 1,086. The receipts realised for mechanical assistance rendered to cultivators amounted to about Rs. 846. The applications of cultivators for grant of tagai loans for the purchase and erection of engines and pumping plants for agricultural purposes, were recommended to Government.

(*iii*) *Water Finding.*—Ninety-five applications for investigation of boring sites were received from the cultivators and dealt with promptly. The total receipts realised from inspection of boring sites amounted to Rs. 1,265. Two water-finding machines were sold to the Sirohi State.

(*iv*) *Building Construction.*—During the year under report, construction works of the value of Rs. 3,07,500 were carried out at 20 different places. Plans and estimates for the buildings, the latter amounting to Rs. 1,48,000, were prepared. Twenty-four plans and estimates for the buildings to be constructed by the co-operative societies were scrutinized and the necessary advice was given.

(*v*) *Training.*—Four classes for the training of cultivators in the installation, operation and maintenance of oil engines and pumps were held at Poona during the year under report. One hundred and one students attended these classes, and of these, 47 students were deputed for training by the Registrar, Co-operative Societies. After training, these latter men were to be appointed as drivers-cum-secretaries of the co-operative lift irrigation schemes. A similar class was held at Baroda for the training of 39 candidates deputed by the Registrar, Co-operative Societies.

98. *Mechanical Cultivation.*—During the year under report, deep and shallow ploughing was carried out on 29,750 acres and 40,675 acres, respectively. The rates charged for this work were Rs. 22 per acre for deep ploughing and Rs. 14 per acre for shallow ploughing. Harrowing operations at the rate of Rs. 6 per acre were undertaken on 10,933 acres of land. Grading work was carried out for 17,644 hours at the rate of Rs. 4 per hour. The total receipts realised from these operations were Rs. 15,36,231 as against the total expenditure of Rs. 15,11,359. One hundred and one Zetor tractors of 20 H. P. and 14 tractors

of 60 H. P. were purchased during the year. In addition, 6 tractors were received from the former Baroda State and 16 reconditioned bull-dozers of 80 H. P. were purchased. The total number of tractors and bull-dozers with the Mechanical Cultivation Section was 254 during the year. There are 26 operational units, each consisting of 4-6 tractors, engaged in ploughing and harrowing operations in the State. Two mobile maintenance units were stationed at Dharwar and Kopergaon for repairs to the tractors, and there is one central workshop at Poona for similar work.

CHAPTER IX

Minor Irrigation

99. *Wells.*—Under the scheme for the construction of new wells and improvement of old wells, it is proposed to construct 50,000 new wells and improve 10,000 existing wells by offering subsidies and *tagai* loans to the cultivators. During the year under report, 5,915 new wells were constructed and 2,198 old wells were repaired.

100. *Temporary Bandharas.*—During the year under review, 1,131 temporary *bandharas* were constructed, and an area of 9,530 acres of *vaingan* paddy and pulse crops was irrigated. With a view to developing irrigation facilities for agricultural purposes in the State, Government sanctioned a separate scheme for the construction of *katcha* and *pucca bandharas* and for repairs to small irrigation tanks. Under this scheme, it is proposed to give a subsidy equal to 50 per cent of the total cost incurred by cultivators for the construction of a new *katcha bandhara* subject to a maximum of Rs. 10 per additional acre of land brought under cultivation. This scheme is being executed by the District Rural Development Boards and is in operation in all the districts of the State, except the Konkan districts of Kolaba, Ratnagiri, Thana and North Kanara. In all, 2,016 *bandharas* were constructed during the year, providing irrigation for 21,045 acres of land.

101. *Tanks and Permanent Bandharas.*—In pursuance of the recommendation of the Administrative Inquiry Committee, Government decided to transfer all minor irrigation works to

the Public Works Department. Accordingly, all the minor irrigation works, except the masonry *bandharas* at Ambasan, in the Nasik district, the two irrigation tanks at Yellihadalgi and Avaroli, both in the Belgaum district, and the diversion bund at Kasmalgi, in the Belgaum district, were transferred to the Public Works Department. The construction of the irrigation tank at Kachrol, in the Ahmedabad district, which was undertaken as a scarcity work, was retained by the Agricultural Department. As a result of the work so far completed and the work still to be completed by the Agricultural Department and the Public Works Department, an area of 15,193 acres will be brought under irrigation. The additional production from this area will be about 3,040 tons of foodgrains.

102. *Lift Irrigation Scheme.*—Work on the 13 Lift Irrigation Schemes was in progress during the year under report. The Lift Irrigation Scheme at Miroli on the Sabarmati river was administratively approved by Government during the year. It was decided that, in addition to these 14 Lift Irrigation Schemes, no work on other Lift Irrigation Schemes should be undertaken by the Agricultural Department. When these Lift Irrigation Schemes are completed, an area of 35,139 acres of land will be brought under irrigation, including the area under the Lift Irrigation Schemes already completed by the Public Works Department. During the year under report, the Lift Irrigation Schemes at Ratnapur, in the Kaira district, Nikora, in the Broach district, Kadod, in the Surat district, Titwa, in the Surat district and Padmale, in the South Satara district, were partially completed.

103. *Emergency Lift Irrigation Scheme.*—An Emergency Lift Irrigation Scheme for growing fodder crops during the scarcity period of 1949 was started at Miroli on the river Sabarmati, in the Ahmedabad district. As it was proposed to undertake a permanent Lift Irrigation Scheme at Miroli, the engines and pumps used for the Emergency Lift Irrigation Scheme were utilised for irrigating paddy crops during the *kharif* season of 1949 and the wheat crops during the 1949-50 *rabi* season.

CHAPTER X

Land Improvement Work

104. *Introduction.*—As a result of the merger of the States with the Bombay State, the soil conservation work in the former States of Baroda and Kolhapur was taken over by the Agricultural Department. In accordance with the provisions of the Land Improvement Schemes Act, Land Improvement Boards have now been constituted in the newly formed districts of the State, and there is now a District Land Improvement Board in each district.

105. *Large Scale Bunding.*—During the year under report, consolidation (improvement) of 40,470 acres of land was carried out, and 38,061 acres of the previously bunded area were surveyed and plans and estimates of the consolidation work to be executed were prepared. About 6,939 acres were newly bunded, and 55,377 acres were surveyed and plans and estimates in respect of this area were also prepared. In addition to human and bullock labour used for constructing bunds, bull-dozers were also used for the purpose. Grass was planted on the outlets of the bunds in order to determine its utility in the consolidation of the outlets as compared to the stone or pipe outlets now in common use. Statistical data were also collected to show the extent to which the water supply in wells in the bunded area had improved.

106. *Small Scale Bunding.*—A scheme for small scale bunding was sanctioned by Government for a period of one year in the first instance. This scheme is to be operated in the Sholapur district and in the scarcity area of the Poona district. Applications were received for small scale bunding in an area of 4,171 acres, and plans and estimates for bunding an area of 2,041 acres were prepared during the year under report.

107. *Afforestation.*—No new afforestation works were undertaken during the year under report. Wherever regeneration in the areas already afforested has been successful, steps were taken to maintain these areas.

108. *Records of Rights and Liabilities under the Land Improvement Schemes Act.*—Draft schemes in respect of 143 villages were prepared and approved by the Land Improvement Boards during the year under report. Fifty-one recovery statements under Section 13 (*1*) of the Land Improvement Schemes Act were prepared during the year under report in respect of about 11,230 acres and sent to the Mamlatdars concerned for

effecting recovery and entry in the Records of Rights under Section 13 (2) of the Land Improvement Schemes Act. The total amount to be recovered comes to Rs. 7,037-8-0. Of the 114 draft schemes prepared for an area of 32,868 acres and submitted to the District Land Improvement Boards for sanction, 91 schemes covering an area of about 25,433 acres have been approved by the Boards.

109. *Survey and Classification of Cultivable Waste Lands.*—In addition to the work of survey and classification of Government waste lands in compact blocks of 100 acres and over, the staff appointed under the scheme was entrusted with the work of survey and classification of lands given out for cultivation on *eksali* lease by the Revenue Department, in villages other than those where the survey of lands in compact blocks was being carried out. An area of 5,18,220 acres was inspected in 905 villages having compact blocks of 100 acres and more, and 1,85,950 acres were found to be suitable for cultivation. Special colonisation schemes were prepared and submitted to Government. As regards the inspection of lands given out on *eksali* lease, an area of 96,746 acres was inspected in 257 villages, and 38,235 acres of this area were found fit for cultivation.

110. *Departmental Agricultural Engineering and Soil Conservation Committee.*—In addition to 4 departmental committees constituted in 1948 for dealing with research and development work in the different branches of the agricultural science, another committee was constituted during the year under report to deal with agricultural engineering and soil conservation problems. This committee is called the Agricultural Engineering and Soil Conservation Committee. It held one meeting during the year under report.

CHAPTER XI

Agricultural Propaganda

111. *Introduction.*—Propaganda work in connexion with the 'Grow More Food' Campaign was intensified during the year, and the Co-operative and the Revenue Departments assisted the Agricultural Department in this work. The members of the Rural Development Boards were also of great help in explaining to the cultivators the importance of the 'Grow More Food' Campaign in the context of self-sufficiency of the country. About 8,000 agricultural shows and demonstrations were specially held at the Agricultural Demonstration Centres to explain

to the cultivators the improved methods of cultivation devised by the Agricultural Department. Agricultural and cattle shows were held at 169 places in the State, and the officers of the Agricultural Department took active part in arranging the shows. The District Agricultural Officers continued to do useful work in popularising improved methods of agriculture and in arranging for the supply of agricultural requisites to the cultivators.

112. *'Grow More Food' Campaign.*—The object of the Campaign is to step up food production in the State by extending the area under foodcrops and increasing the yield per acre of the different crops by distribution of improved seeds and manures, provision of irrigation facilities, etc. The seasonal conditions in Gujarat during the year under report were favourable to the *kharif* and *rabi* crops. In the Deccan, the rains commenced late and there was drought in the month of July. Heavy rains received in September and October proved favourable to *rabi* crops, but these rains caused some damage to the standing *kharif* crops. In the Karnatak also, the rains started late and there were long breaks in the rains in the months of July and August. The standing crops were affected by the break in the rains. Late rains experienced in September and October were favourable to both the *kharif* and *rabi* crops. Information regarding the distribution of improved seeds and manures is given in Chapters V and VI. Similar information on the construction of temporary *bandharas* will be found in Chapter IX.

Under the scheme for the purchase and distribution of *Numbri* seed potatoes in the State, 1,37,448 maunds of seed potatoes were distributed among cultivators at cost price, for planting in the *rabi* season. The area planted under seed potatoes imported from Simla was 8,863 acres, the produce of which was approximately 15,827 tons of potatoes.

Under the Vegetable Development Scheme, 9,933 acres of land was brought under vegetable cultivation. Sweet potato cultivation in the State was extended by 11,131 acres during the year.

An area of about 5,200 acres of land was cleared of overgrowth, and 1,023 acres out of this area were brought under cultivation during the year under report.

Details regarding the scheme for the control of insect pests and plant diseases of crops have been given in Chapter IV.

113. *Agricultural Demonstration Centres.*—The number of Agricultural Demonstration Centres in the State was the same as in the last year, i. e., 244. Thirty-four Agricultural Demonstration Centres were shifted to new places. These centres have continued to do very useful work in carrying out agricultural propaganda under the 'Grow More Food' Campaign. As already stated above, about 8,000 demonstrations and meetings of cultivators were held at the Agricultural Demonstration Centres in the State.

114. *Model Agricultural Projects.*—The work of the two Model Agricultural Projects, one at Mirakhedi, in the Panchmahals district, and the other at Chinchapada, in the West Khandesh district, was continued during the year, according to the approved technical programme laid down for each project. The other two projects sanctioned last year by Government viz., one at Nawalpur and the other at Amoda, in the West Khandesh district, were started during the year under report.

115. *"Officials' Demonstrations" and "Farmers' Weeks" on Government Farms.*—During the year under report, the "Officials' Demonstrations" and "Farmers' Weeks" were held at the Rice Breeding Station, Mugad, the Sugarcane Research Station, Padegaon, the Salt Land Paddy Station, Panvel, the Government Farm, Surat, the Crop Breeding Station, Bijapur, the Rice Breeding Station, Nawagam, the Demonstration Farm, Ahwa, and the Agricultural Schools, Dohad and Borgaon. "Parents' Day" was observed at most of the Agricultural Schools in the State, when the activities of the schools and the farms attached to the schools were explained to the cultivators who had assembled at the schools.

CHAPTER XII

Agricultural Education

116. *Agricultural Colleges.*—The College of Agriculture, Poona, has completed the 42nd year of its working. This college combines the functions of education with those of research and serves as a central research institute of the Agricultural Department. During the year under review, the number of students on the rolls of the College was 399, of whom 188 appeared for the B.Sc. (Agri.) Examination of the University of Poona held in March, 1950. The number of students who were

successful at this examination was 151. The number of post-graduate students engaged on research in the different branches of the agricultural science was 48. A batch of 30 students of this College visited the villages in the neighbourhood of Poona in alternate weeks and helped the villagers in their agricultural work. Such visits proved very useful to the students, who were able to understand some of the difficulties experienced by the cultivators in their daily work.

During the year under report, the average milk yield of Sindhi cows at the Poona Agricultural College Dairy Farm was 2,780 lb. The three best Sindhi cows gave 6,523 lb., 5,846 lb. and 5,250 lb. of milk as the annual average over a period of four, four and five lactations, respectively. The average milk yield per head of Surati and Delhi buffaloes at the Dairy Farm was 3,327 lb. The three best buffaloes have given 7,485 lb., 7,300 lb. and 7,198 lb. as the annual average of 11, 6 and 5 lactations, respectively. The total quantity of milk produced during the year was 4,73,301 lb., of which 18,213 lb. of milk was fed to calves and 27,272 lb. of milk was used for teaching purposes and for manufacture of milk products. The cost of producing 100 lb. of milk was Rs. 42-11-4, and the receipts were Rs. 43-12-0. The total quantity of fodder produced by the Dairy Farm was 2,59,860 lb. dry fodder and 27,11,553 lb. green fodder. Twenty-five Sindhi heifers and 10 breeding bulls were sold to *bona fide* cultivators.

The College of Agriculture, Dharwar, has completed the third year of its working. The total number of students on the rolls of the College was 207, of whom 83 students appeared for the B.Sc. (Agri.) Examination of the Karnatak University. The number of successful students at this examination was 72. Thirty students have enrolled themselves for post-graduate work at the College.

The College of Agriculture, Anand, has also completed the third year of its existence. There were 252 students on the rolls of this College. Of the 89 students who appeared for the B.Sc. (Agri.) Examination of the University of Bombay, 64 students were successful.

117. *Agricultural Schools.*—Three more Agricultural Schools have been established during the year under report, bringing the total number of schools in the State to 17. Five hundred and fifty four students were admitted to the different schools during the year. The number of students who passed out of these schools after successfully completing the two-year course of training, was 350.

CHAPTER XIII

Miscellaneous Work

118. *Agricultural Research Committee.*—This Committee held its annual meeting in August, 1949, instead of in May as is the usual practice. At this meeting, the progress of agricultural research in the Bombay State was reviewed and the programme of work for the following year was laid out.

119. *Vegetable Department Scheme.*—During the year under review, the area under vegetable cultivation increased by 9,906 acres. Arrangements for the production of vegetable seeds were made at the Agricultural Schools. These seeds were supplied to the growers at cost price. An intensive campaign was undertaken to encourage vegetable cultivation in the bungalow compounds, and vegetable seeds were supplied to the owners of the bungalows and also to other persons. The area under sweet potato cultivation was extended by 11,171 acres, the greatest extension of the area under this crop being in the Belgaum district. Arrangements were also made to supply sweet potato vines to cultivators in the Kolaba and Thana districts. Vines of improved varieties of sweet potatoes, viz., C. L. 44 and B.2 were multiplied on the farms of the Agricultural Schools, for distribution among the growers. About 1,100 tons of fresh sweet potatoes were supplied to the Civil Supplies Department for sale at the ration shops in the Bombay State.

120. *Scheme for Extension of Potato Cultivation.*—Under this scheme, arrangements were made for the purchase and despatch of 62,088 bags of seed potatoes from Simla for planting in the *rabi* season of 1949. Owing to failure of late rains, some of the cultivators were not able to plant seed potatoes, and accordingly 3,406 bags of seed potatoes were disposed of for consumption.

121. *Agronomical Research.*—The model experiments drawn up by the Special Agronomy Committee of the Agricultural Department, described in the last year's report, were continued during the year. The Special Agronomy Committee met once during the year and considered the progress of these experiments. The main points of interest arising from these experiments may be summarised as below:—

(*a*) In connexion with the spacing-cum-seedlings per bunch experiments on transplanted paddy, narrow sowing was found to give better results than wide sowing in trials conducted at

Bulsar, Kumta, Ratnagiri and Igatpuri, whilst no such differences could be discerned in trials conducted at Vadgaon. At Karjat, wide sowing between the plants in the row resulted in an increase in the yield of the paddy crop, which was economically profitable. Six seedlings per bunch appeared to be the minimum number of seedlings for economically profitable yields, in trials conducted at Bulsar, Kumta, Ratnagiri and Igatpuri, whilst at Karjat and Vadgaon, 8 seedlings per bunch gave better results.

(*b*) In the case of drilled paddy, spacing of 18", combined with a seed rate of 60 lbs. per acre, gave the best results as regards yield at Mugad.

(*c*) The results of manurial experiments involving graded doses of nitrogen in the form of groundnut cake showed that there was a linear response of paddy crop to the application of nitrogen in trials conducted at Kumta. At Karjat, the highest yield of paddy was obtained with 112 lbs. of nitrogen applied per acre to the crop. Similar experiments conducted on wheat at Niphad showed that the application of 60 lb. nitrogen per acre gave the best results.

122. *Crop Weather Observation Scheme.*—Government have sanctioned the continuance of the Crop Weather Observation Scheme at 9 experimental farms in the Bombay State on a permanent basis. In addition to these stations, two small meteorological observatories have been set up at Mugad for making observations on rice crop and at Mohol for observations on jowar crop. Crop weather observations were recorded on a co-ordinated basis at Poona for sugarcane, Padegaon for sugarcane, Karjat for paddy, Dharwar for jowar, cotton and wheat, Jalgaon for jowar, cotton and wheat, Surat for cotton and Viramgam for cotton. The meteorological and crop growth data from all these stations were sent to the Director of Agricultural Meteorology.

CHAPTER XIV

ADMINISTRATION AND FINANCE

A. *Administration*

123. During the year under report, the 'Grow More Food' Campaign continued to engage the attention of the officers of the Agricultural Department. Scientific research work has been continued and further strengthened particularly in crop breeding. The generous financial assistance of the Indian Council of Agricultural Research, the Indian Central Cotton Committee and the Sir Sassoon David Trust Fund was continued during the year under review.

Government have accepted the recommendations of the Administrative Inquiry Committee that all activities of the Agricultural Department should be under the control of a single Director and that the Agricultural Department should be classed as a major department of Government. Accordingly, the Directorate of Agricultural Engineering has been constituted into a sub-department of the Agricultural Department under the charge of a Joint Director of Agriculture (Engineering). For extending cotton cultivation in the State, Government have sanctioned a special post of Cotton Development Officer.

124. *Staff.*—The undernoted major changes in the staff took place during the year under report:—

Shri V. C. Pavate, Deputy Director of Agriculture (Manures, Fertilizers and Rural Development), was appointed to officiate as Principal, College of Agriculture, Dharwar, with effect from the 1st September, 1949, *vice* Shri H. M. Desai retired.

Dr. R. D. Rege, Deputy Director of Agriculture (Research and Education), was transferred as Deputy Director of Agriculture (Manures, Fertilizers and Rural Development), *vice* Shri V. C. Pavate transferred.

Dr. J. A. Daji, Agricultural Chemist to Government, was transferred and appointed Deputy Director of Agriculture (Research and Education), *vice* Dr. R. D. Rege. Dr. N. Narayana, Professor of Agricultural Chemistry, College of Agriculture, Dharwar, was appointed to officiate as Agricultural Chemist to Government in the B. A. S., Class I, with effect from the 17th September, 1949, *vice* Dr. J. A. Daji.

Shri M. A. S. Iyengar, Land Improvement Investigator, Sholapur, was transferred and appointed Professor of Agricultural Chemistry, College of Agriculture, Dharwar, in the B. A.

S., Class II, *vice* Dr. N. Narayana with effect from the 13th September, 1949.

Dr. R. D. Rege, Deputy Director of Agriculture (Manures, Fertilizers and Rural Development), was transferred and appointed Sugarcane Specialist, Sugarcane Research Scheme, Padegaon, with effect from the 3rd November, 1949.

Shri A. K. B. Cazi, Assistant Marketing Officer in the Co-operative Department, was reverted to the Agricultural Department and appointed to officiate as Deputy Director of Agriculture (Manures, Fertilizers and Rural Development), in the B. A. S., Class I, with effect from the 20th April, 1950.

Dr. S. W. Mensinkai was appointed to officiate as Fibre Development Officer in the B. A. S., Class I, with effect from the 1st May, 1950.

Dr. G. A. Patel was appointed Agricultural Entomologist to Government, B. S., Poona, in the B. A. S., Class I, with effect from the 19th May, 1950.

Shri G. T. Babriwala, Senior Breeder in the scheme for the improvement of grass and leguminous fodder crops, was appointed Plant Breeder and Officer incharge Rice Breeding Station, Dharwar.

Shri K. A. Jalihal, Lecturer in Agronomy, College of Agriculture, Dharwar, was appointed Superintendent, Agricultural School, Devihosur, in the B. A. S., Class II.

Shri P. V. Wagle, Crop Protection Officer, Sugarcane Development Scheme, Ahmednagar, who was holding charge of the post of District Agricultural Officer, Ahmednagar, in addition to his own duties, was appointed to officiate as District Agricultural Officer, Ahmednagar, with effect from the 21st June, 1949, to the 10th October, 1949.

Shri D. M. Kulkarni, Sub-Divisional Soil Conservation Officer, Ahmednagar, was appointed to officiate as District Agricultural Officer, East Khandesh, Jalgaon, from the 4th October, 1949, *vice* Shri P. R. Patil transferred.

Shri P. R. Patil, District Agricultural Officer, East Khandesh, Jalgaon, was transferred and appointed District Agricultural Officer, Ahmednagar, *vice* Shri P. V. Wagle.

Shri P. V. Wagle, District Agricultural Officer, Ahmednagar, was reappointed Crop Protection Officer, Sugarcane Development Scheme, Ahmednagar, with effect from the 11th October, 1949.

Shri S. S. Patel, District Agricultural Officer, Banaskantha, was on leave from the 15th July, 1949, to the 31st August, 1949, and from the 13th October, 1949, to the 9th March, 1950. Shri H. U. Vora, Assistant District Agricultural Officer, Banaskantha, Palanpur, was appointed to officiate as District Agricultural Officer, Banaskantha, Palanpur, during the absence on leave of Shri S. S. Patel.

Dr. B. A. Chaugule was appointed to officiate as Assistant Professor of Agronomy, College of Agriculture, Poona, in the B. A. S., Class II, with effect from the 1st September, 1949.

Shri G. G. Nawathe, formerly Deputy Director of Agriculture, Baroda, was appointed District Agricultural Officer, Mehsana, in the B. A. S., Class II, with effect from the 1st August, 1949.

Shri P. C. Mehta, formerly Horticultural Officer, Baroda, was appointed District Agricultural Officer, Amreli, in the B. A. S., Class II, with effect from the 1st August, 1949.

Shri A. F. Patel, formerly Assistant Deputy Director of Agriculture, Baroda, was appointed District Agricultural Officer, Baroda, with effect from the 1st August, 1949.

Shri H. C. Patil, Superintendent, Agricultural School, Manjri, was permitted to hold charge of the post of Inspector of Agricultural Schools, in addition to his own duties, with effect from the 26th August, 1949.

Shri S. R. Bagal was appointed to officiate as Assistant Entomologist, Combined Scheme for Controlling Trichogramma and Other Pests of Sugarcane, in the B. A. S., Class II, with effect from the 7th November, 1949.

Shri V. V. Patel, Cotton Superintendent, Surat, was on leave on average pay for 4 months, with effect from the 20th February, 1950, and Shri R. J. Naik, Technical Assistant to the Cotton Botanist, Bombay State, Surat, was appointed to officiate as Cotton Superintendent, Surat, in the B. A. S., Class II, during the absence on leave of Shri V. V. Patel.

On return from the United States of America, Dr. H. R. Arkeri was appointed to officiate as Professor of Agronomy, College of Agriculture, Dharwar, in the B. A. S., Class II, with effect from the 18th September, 1949, *vice* Shri B. H. Patil.

Shri B. H. Patil was appointed to officiate as Professor of Animal Husbandry and Dairying, College of Agriculture, Dharwar, in the B. A. S., Class II, with effect from the 18th September, 1949.

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On return from the United States of America, Shri N. Gopalkrishna, Agricultural Officer in the Scheme for the Botanical Improvement of Vegetables, was appointed to officiate as Assistant Horticulturist to Government, Bombay State, Poona, with effect from the 12th September, 1949, *vice* Shri B. A. Nazareth on leave.

Shri G. V. Hardikar, District Agricultural Officer, Nasik, was granted leave on average pay for 4 months followed by leave on half average pay for 3 months and six days preparatory to retirement with effect from the 6th January, 1950.

Shri G. K. Phadtare, Compost Development Officer (Rural), was appointed to officiate as District Agricultural Officer, Nasik, *vice* Shri G. V. Hardikar, with effect from the 6th January, 1950.

Shri V. S. Habbu, District Agricultural Officer, North Kanara, Karwar, held charge of the post of Agricultural Officer incharge Scheme for Colonisation and Cultivation of Waste Lands at Indoor, in addition to his own duties, *vice* Shri S. G. Kadkol retired with effect from the 21st January, 1950.

The post of Superintendent, Agricultural School, Borgaon, was converted into a post in the B. A. S., Class II, and Shri G. R. Yadav, Improved Seed Supply Officer, was transferred and appointed to officiate in it, with effect from the 24th May, 1950.

Shri R. M. Chaudhary, formerly Professor of Agronomy, College of Agriculture, Poona, was re-employed as Superintendent, 'Grow More Food' Campaign, Poona, in the B. A. S., Class II, with effect from the 14th April, 1950.

Shri K. L. Shiggaon was appointed to officiate as Professor of Veterinary Science, College of Agriculture, Dharwar, in the B. A. S., Class II, with effect from the 22nd June, 1950.

Shri P. S. Kulkarni, Agricultural Officer, was appointed District Agricultural Officer, Satara South, Sangli, in the B. A. S., Class II, with effect from the 2nd April, 1950.

Shri S. G. Patil was appointed to officiate as Superintendent, Agricultural School, Kolhapur, in the B. A. S., Class II, with effect from the 28th June, 1950.

Shri G. M. Talgeri, Agricultural Officer, DDT Scheme, was appointed to officiate as Crop Protection Officer in the Scheme for Organisation of Crop Protection Service in the Bombay State, in the B. A. S., Class II, with effect from the 29th June, 1950.

Shri S. K. Goni, Professor of Animal Husbandry and Dairying, College of Agriculture, Dharwar, was granted study leave and deputed to the U. S. A. for higher training in Animal Husbandry and Dairying, with effect from the 12th August, 1948, to the 12th August, 1950.

Shri M. S. V. Rama Rao, Divisional Soil Conservation Officer, S. D., Bijapur, in the B. A. S., Class I, was transferred and appointed Divisional Soil Conservation Officer, Central Division, Poona, *vice* Shri M. K. Shirole, with effect from the 19th September, 1949.

Shri G. V. Patel, Sub-Divisional Soil Conservation Officer, Dohad, in the B. A. S., Class II, was appointed to officiate as Divisional Soil Conservation Officer, Surat, in the B. A. S., Class I, *vice* Shri R. B. Mutalik Desai, retired, with effect from the 13th July, 1949.

Shri K. D. Gumaste, Sub-Divisional Soil Conservation Officer, N. D., Bijapur, in the B. A. S., Class II, was appointed to officiate as Divisional Soil Conservation Officer, S. D., Bijapur, in the B. A. S. Class I, *vice* Shri M. S. V. Rama Rao transferred, with effect from the 15th September, 1949.

Shri M. K. Shirole, Divisional Soil Conservation Officer, C. D., Poona, in the B. A. S., Class I, was appointed to officiate in the post of Land Utilisation Survey Officer in the B. A. S., Class I, with effect from the 19th July, 1949. He held charge of the post of Divisional Soil Conservation Officer, C. D., Poona, in addition to his own duties from the 19th July, 1949, to the 18th September, 1949.

Shri M. S. V. Rama Rao, Divisional Soil Conservation Officer, C. D., Poona, was appointed to hold charge of the post of Land Utilisation Survey Officer, in the B. A. S., Class I, in addition to his own duties, *vice* Shri M. K. Shirole, whose services were placed at the disposal of the Government of India with effect from the 13th November, 1949.

Shri R. V. Satpute, Sub-Divisional Soil Conservation Officer, Sholapur, was appointed to officiate as Technical Assistant in the office of the Soil Conservation Officer, B. S., Poona, in the B. A. S., Class II, with effect from the 23rd September, 1949.

Shri T. G. Yawgal, Sub-Divisional Soil Conservation Officer, Pandharpur, in the B. A. S., Class II, was transferred as Sub-Divisional Soil Conservation Officer, W. D., Bijapur, *vice* Shri R. F. Patil transferred, with effect from the 1st August, 1949.

Shri B. K. Shinde, Land Assistant, Sholapur, was appointed to officiate as Sub-Divisional Soil Conservation Officer, Sholapur *vice* Shri R. V. Satpute, with effect from the 22nd September, 1949.

Shri A. M. Pandya, Land Assistant, Dohad, was appointed to officiate as Sub-Divisional Soil Conservation Officer, Dohad, *vice* Shri G. V. Patel transferred, with effect from the 16th September, 1949.

Shri N. K. Ghumare, Land Assistant, Dohad, was appointed to officiate as Sub-Divisional Soil Conservation Officer, Ahmednagar, *vice* Shri D. M. Kulkarni transferred, with effect from the 28th September, 1949.

Shri H. V. Rajmane, Land Assistant, Bijapur, was appointed to officiate as Sub-Divisional Soil Conservation Officer, N. D., Bijapur, *vice* Shri K. D. Gumaste transferred, with effect from the 14th September, 1949.

Shri N. C. Shah, formerly Agricultural Engineer, Baroda State, was appointed Assistant Agricultural Engineer, Headquarters Expansion Scheme, Poona, in the B. A. S., Class II, *vice* Shri C. K. Shah transferred, with effect from the 30th September, 1949, afternoon.

Shri C. K. Shah, on relief, took over charge of the post of Assistant Agricultural Engineer, Lift Irrigation Scheme, Poona, with effect from the 1st October, 1949, from Shri N. S. Soman, who was then holding dual charge of the posts of Assistant Agricultural Engineer, Lift Irrigation Scheme, Poona and Broach.

Shri N. S. Soman, Assistant Agricultural Engineer, Lift Irrigation Scheme, Broach, was transferred and posted as Assistant Agricultural Engineer, Lift Irrigation Scheme (Headquarters), Poona, *vice* Shri C. K. Shah, with effect from the 12th December, 1949. Shri C. K. Shah, on relief, was appointed Assistant Agricultural Engineer, Lift Irrigation Scheme, Broach, *vice* Shri N. S. Soman, with effect from the 12th December, 1949.

Shri R. S. Tamhane, Foreman Supervisor in the Mechanical Cultivation Section, was appointed to officiate as Assistant Mechanical Cultivation Engineer in the B. A. S., Class II, *vice* Shri S. A. Kothavale with effect from the 5th August, 1949.

Shri A. K. Ranade was re-employed as Executive Engineer, Poona Minor Irrigation Division, with effect from the 15th January, 1950. He also held charge of the post of Deputy Director

of Agriculture (Engineering) in addition to his own duties, *vice* Shri B. K. Choksi transferred to the P. W. D. from the 26th January, 1950, to the 10th April, 1950, and was appointed Deputy Director of Agriculture (Engineering) with effect from the 11th April, 1950.

Shri B. S. Apte, Executive Engineer, Bijapur Lift Irrigation Division, was on leave for 90 days with effect from the 8th May, 1950, with permission to prefix Sunday the 7th May, 1950.

Shri G. B. Bagul, Deputy Engineer and Personal Assistant to the Superintending Engineer, Karnatak Irrigation Circle, was appointed to officiate as Executive Engineer, Bijapur Lift Irrigation Division, *vice* Shri B. S. Apte, with effect from the 8th May, 1950.

Shri B. S. Apte, Executive Engineer, Ahmedabad Minor Irrigation Division, was transferred as Executive Engineer, Dharwar Minor Irrigation Division, *vice* Shri V. B. Manerikar transferred to the Public Works Department, with effect from the 12th October, 1949.

Shri L. A. Patel, Executive Engineer, Broach Minor Irrigation Division, held charge of the post of Executive Engineer, Ahmedabad Minor Irrigation Division, in addition to his own duties, *vice* Shri B. S. Apte transferred, with effect from the 8th October, 1949, afternoon, to the 31st October, 1949.

Shri R. L. Deshpande, Executive Engineer, Minor Irrigation Division, Belgaum, was granted leave for 31 days with effect from the 1st March, 1950. Shri B. S. Apte, Executive Engineer, Minor Irrigation Division, Dharwar, held charge of the post of Executive Engineer, Minor Irrigation Division, Belgaum, in addition to his own duties, from the 1st March, 1950, to the 10th April, 1950.

Shri V. M. Desai, Deputy Engineer, Ahmedabad Minor Irrigation Sub-division, was transferred and appointed Deputy Engineer, Broach Minor Irrigation Sub-division, with effect from the 26th January, 1950, *vice* Shri P. A. Raj, Deputy Engineer, who was granted leave and repatriated to the P.W.D.

Shri M. C. Khatwani, Deputy Engineer, Ahmedabad Minor Irrigation Project Sub-division, held charge of the Ahmedabad Minor Irrigation Sub-division, in addition to his own duties, from the 18th January, 1950, to the 28th February, 1950, and on the closing down of the Ahmedabad Project Minor Irrigation Sub-division, he was appointed Deputy Engineer, Ahmedabad Minor Irrigation Sub-division.

Shri M. R. Ghodke, Deputy Engineer, West Khandesh Minor Irrigation Sub-division, Dhulia, held charge of the post of Deputy Engineer, Minor Irrigation Sub-division, Nasik, in addition to his own duties, *vice* Shri S. T. Dange, Deputy Engineer, transferred, from the 30th March, 1950, to the 31st March, 1950. and on the closure of the West Khandesh Minor Irrigation Sub-division, he was appointed Deputy Engineer, Nasik Minor Irrigation Sub-Division.

Shri S. T. Dange, Deputy Engineer, on relief was transferred and appointed Technical Assistant in the office of the Director of Agriculture, *vice* Shri S. M. Bhide, Technical Assistant, transferred, with effect from the 6th April, 1950, afternoon.

Shri S. M. Bhide, Technical Assistant, on relief, was transferred and appointed Deputy Engineer, Bagalkot Lift Irrigation Sub-division, Bijapur, *vice* Shri G. M. Vaidya, Deputy Engineer, who was granted leave with effect from the 17th April, 1950.

Shri B. S. Naik, Deputy Engineer, East Khandesh Minor Irrigation Sub-division, was on the closing down of that Sub-division, repatriated to the Public Works Department, with effect from the 1st April, 1950.

Shri D. B. Shetwal, officiating Deputy Engineer, Haveri Minor Irrigation Sub-division, was on the closing down of that Sub-division repatriated to the Public Works Department, with effect from the 1st April, 1950.

Shri M. G. Krishinappa, officiating Deputy Engineer, East Belgaum Minor Irrigation Sub-division, was on the closing down of that Sub-division, repatriated to the Public Works Department, with effect from the 1st April, 1950.

B. *Finance*

125. *Departmental Expenditure and Receipts.*—The expenditure of the Agricultural Department for the year under report amounted to Rs. 2,71,04,495 as against Rs. 2,39,29,217 in the previous year. The increase in expenditure was largely due to the 'Grow More Food' Campaign. The receipts of the Department from all the sources were Rs. 1,85,27,929 as against Rs. 1,54,96,362 in the previous year. The increase was mainly due to larger grants from the Government of India as subsidy for the 'Grow More Food' Schemes and other Post-war Reconstruction Schemes.

126. *Subsidies and Grants.*—The undernoted subsidies and grants were received for research and developmental work during the year under report:—

	Rs.
(*a*) From the Indian Council of Agricultural Research for various research schemes.	606
(*b*) From the Indian Central Cotton Committee for the various research schemes and seed multiplication and distribution schemes.	1,47,030
(*c*) From the Trustees of the Sir Sasson David Trust Fund for research schemes for agricultural development.	15,152
(*d*) From the Government of India from the Central Revenues in furtherance of the Food Production Campaign.	1,09,00,000
Total ...	1,10,62,788

127. *Personal Ledger Accounts.*—The undernoted amounts were placed at the disposal of the Director of Agriculture, during year under report, for purchase of containers, vegetable seeds, etc., and for purchase of sweet potatoes:—

	Rs.
(*a*) Personal Ledger Account for purchase of containers, vegetable seeds, manures, etc.	10,000
(*b*) Personal Ledger Account for purchase of sweet potatoes.	1,00,000
Total ...	1,10,000

The following additional amounts were placed at the disposal of the District Agricultural Officers, during the year under report, for (*i*) financing the purchase and distribution of improved seeds for the 'Grow More Food' Campaign and for (*ii*) purchase and distribution of groundnut cake for application to foodgrain crops:—

	Rs.
(*a*) Personal Ledger Account for purchase and distribution of improved seeds for the 'Grow More Food' campaign.	8,06,000
(*b*) Personal Ledger Account for purchase and distribution of groundnut cake for application to foodgrain crops.	1,10,34,290
Total ...	1,18,40,290

No additional amounts were sanctioned during the year under report to augment the following existing Personal Ledger Accounts at the disposal of the Director of Agriculture:—

	Rs.
(*a*) Personal Ledger Account for financing cotton seed distribution work at the disposal of the Director of Agriculture.	3,75,000
(*b*) Personal Ledger Account for financing the preparation of manure mixture.	75,00,000
(c) Personal Ledger Account for purchase of *Numbri* seed potatoes from Simla.	68,79,000
(*d*) Personal Ledger Account for purchase and distribution of seeds (ordinary) and implements.	1,00,000
Total ...	1,48,54,000

B. N. UPPAL,

Director of Agriculture,
Bombay State.

Appendix I

Summary of the Work done at the College of Agriculture, Poona, for the year 1949-50

The College of Agriculture has completed forty-two years of its existence.

A. *Staff and Administration*

Shri L. S. S. Kumar held charge of the office of the Principal in addition to his own duties as Economic Botanist to Government, B. S., Poona.

Shri R. M. Chaudhari has retired from the post of Professor of Agronomy, from the 13th February, 1950, and Shri L. S. S. Kumar held charge of the post from the same day.

Dr. G. A. Patel was appointed Agricultural Entomologist to Government, B. S., Poona, from the 19th May, 1950.

Dr. B. A. Chaugule was appointed Assistant Professor of Agronomy, from the 1st September, 1949.

Dr. N. Narayan was appointed Agricultural Chemist to Government, from the 17th September, 1949.

B. *Studentship*

During the year under report, the number of students on the College roll was as under :—

F.Sc. (Agri.) Class	...	106
S.Sc. (Agri.) Class	...	110
B.Sc. (Agri.) Class	...	183
Post graduate	...	48
Total	...	447

C. *Examination Results*

The details regarding the number of students that appeared for the three examinations of the University of Poona, held in March, 1950, and their results are given below :—

Class.	No. of students appeared.	No. of students passed.	Percentage of passes.
F.Sc. (Agri.) Class	138	107	78
S.Sc. (Agri.) Class	134	109	80
B.Sc. (Agri.) Class	188	151	80

D. *Expansion of the College*

The additional staff sanctioned by Government was continued during the year. The building of pavilion has been completed.

E. *Equipment*

Library.—The Library contains 12,126 books and 5,100 bound volumes of scientific periodicals. 125 scientific journals were received in the library and 359 new books were purchased.

The library received a grant of Rs. 2,750, viz., Rs. 1,750 from the contract grant and Rs. 1,000 under the College Expansion Scheme.

F. *The Students' Hostel*

The number of students including post-graduate students in the College hostel was about 258.

During the year, the 37th session of Indian Science Congress was held in Poona, and at the request of the Housing Committee, temporary accommodation was provided to the delegates in the hostel. Dr. B. A. Chaugule was incharge of volunteers for the Indian Science Congress and he carried out the work of accommodating the guests with the help of the monitors.

The various clubs continued to work as before.

G. *Sports and Social Activities*

During the year under report, Professor R. M. Chaudhari continued to be the Chairman of the Gymkhana.

The College Gymkhana.—The activities of the College Gymkhana continued to be satisfactory. The students of the College participated almost in all the items of the Inter-Collegiate sports. The Agricultural Association and Debating Society did good work by arranging for lectures by eminent personalities, such as Shri J. C. Kumarappa, Dr. Khankhoje, Professor Ashby and Annasaheb Karve, the founder of the Women's University in India. This year, 43 newspapers and journals were subscribed for.

The Annual Social Gathering.—This was held in November, 1949, and Shri S. G. Barve, Municipal Commissioner, Poona, addressed the students and Shrimati Barve distributed the prizes.

H. *Students' Literary Activities*

The Poona Agricultural College Magazine.—Professor A. A. Vasavada continued to be the Editor of the Agricultural College Magazine. Four issues of the magazine were published during the year. The articles dealt with varied topics pertaining to agriculture and many of them were contributed by student and members of the Department of Agriculture.

I. *The University Training Corps*

The enrolment of platoon has been completed and it has a strength of 68 cadets. Sgt. Naik has been appointed the CSM of the 'D' Company and Sgt. Desai is leading the Agricultural College platoon.

The following two members of the College staff and one officer in the N. C. C. have undergone special courses at the Mharatta Light Infantry Regimental Centre, Belgaum, from the 1st May, 1950, to the 12th June, 1950:—

2/Lt. L. H. Patil ... Platoon Commanders' Course.
2/Lt. N. R. Paranjpe ... Weapon Training Course.

J. *Aid and Assistance to the Public*

Veterinary Hospital.—The N. S. Veterinary Hospital is under the supervision of officers of the Veterinary Section of the Agricultural College, Poona.

The Veterinary Hospital has rendered good service to the Public. Animals of all types are treated at this Hospital and those belonging to the cultivators and the poor are treated free of charge. In addition, animals of the College Farm, the College Dairy, Sheep and Poultry Farms, and Manjri Agricultural School, are also treated freely.

The number of cases treated during the year 1949-50, are as under:—

(1) Inpatients	...	517
(2) Out patients	...	5,858
Total	...	6,375

316 castrations were done. The daily average attendance is 68.4. The fees recovered from the well-to-do persons during the year are Rs. 2,323-10-0.

K. *The Agricultural College Medical Dispensary*

The College Dispensary continued to work satisfactorily. About 6,090 patients were treated, including staff, students and labourers and some 110 minor operations were performed.

L. *Agricultural College Co-operative Stores*

Professor R. M. Chaudhari continued to be the Chairman for the year 1949-50. The store handled only the business of running a ration shop and sale of prescribed journals required for the students of the College. No meeting was held during the year under report. The store has also a Poor Boys'

Fund, which is specially meant for helping and fulfilling the timely need of the students who take this benefit for paying up their fees, purchase of books, paying up their dues to messes and paying up University Examination fees. About 22 students took advantage of this benefit. The store distributed the amount of Rs. 1,510 towards this fund.

M. *Students Welfare Committee*

The suggestion made by the Committee to ameliorate the conditions of students at the College were carefully gone into and suitable steps were taken wherever possible.

L. S. S. KUMAR,
Principal,
College of Agriculture,
Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

1. Work on remodelling of the Agricultural College Dairy, Kirkee, to be continued.
2. Construction of additional buildings at the College of Agriculture. The work is held in abeyance for want of funds.
3. Conversion of the present 3 years' course for the B.Sc. (Agri.) degree into a four-year course—The four years' course in Agriculture has been accepted in principle by the Academic Council of the Poona University. It is expected to come into force from May, 1951.
4. Administration of the College and provision of increased facilities for welfare of the students.

L. S. S. KUMAR,
Principal,
College of Agriculture.
Poona.

Appendix II

Summary of work done at the College of Agriculture, Dharwar, for the year 1949-50

A. *Staff and Administration*

Shri H. M. Desai held charge of the office of the Principal, College of Agriculture, Dharwar, till the 1st September, 1949. On his retirement, Shri V. C. Pavate was appointed Principal of the College.

The College opened for its new sessions on 15th May, 1949. This time it became a full grade one, as B.Sc. (Agri.) class was added. In May, 1949, the requisite staff to teach B.Sc. (Agri.) class was also appointed.

During this year the work of constructing farm and dairy building was completed. Agronomy and Animal Husbandry staff have shifted to the new site. The electrification work has been completed and the current is available in all first stage buildings. Gas also made available to laboratory blocks and arrangement to supply water is being made. The work of constructing the main building of the College is in full swing.

B. *Studentship*

During the academic year 1949-50, 60 students were admitted to F.Sc. (Agri.) class and there were 62 students in S. Sc. (Agri.) and 85 in B. Sc. (Agri.) class.

C. *Examination Results*

The first Karnatak University examinations in Agriculture were held in March, 1950. It is gratifying to note that though option was given to students to opt either for Bombay or for Karnatak University, all students chose to appear for Karnatak University. The results were quite satisfactory.

The following table gives the performance of students of different classes in the University examinations held in March, 1950.

Class.	No. of students appeared.	No. of students passed.	Percentage of passing.
F.Sc. (Agri.)	70	55	79 per cent.
S.Sc. (Agri.)	65	58	89 per cent
B.Sc. (Agri.)	83	72	87 per cent.

In the B.Sc. (Agri.) examination, two students have been declared to have passed with 1st class distinction, 4 students with 1st class and 25 students with honour.

D. *Post-graduate courses*

The Karnatak University has introduced M.Sc. (Agri.) course in this College in different branches. So far, 30 students have registered their names in different subjects. The following table gives the strength of students working in each subject:—

Name of the subject.	Name of the guide.	No. of students.	Remarks.
Agronomy	... Dr. H. R. Arakeri...	6	All partly by papers and partly by research.
Agri. Botany	... Dr. M. C. Desai ...	4	2 partly by papers & 2 by research.
Agri. Chemistry	... Shri M. A. S. Iyengar.	2	by research.
Agri. Economics	... Dr. N. P. Patil ...	15	5 by research and 10 by papers.
Plant	... Dr. R. S. Deshpande.	1	by research.
Pathology	... Dr. V. P. Bhide ..	2	by research.

E. *Sports and Social activities*

As per Government orders, the College also celebrated various social functions. On 15th August, 1949, " INDEPENDENCE DAY " was celebrated. The day began with hoisting of the Flag by Shri Hukkerikar, M.L.A., who made a short appealing speech on the occasion. This was followed by tree planting all over the College estate by members of the staff and students.

On 25th September, 1949, 'Harijan Day' was observed. As the College was closed for the first term the function was observed by the members of the staff only. Four batches of the staff went to four different villages and each batch was busy throughout the day in taking Prabhat Phery or procession, clearing the streets, taking social dinners and holding meetings.

" MAHATMA GANDHI JAYANTI " Week was observed from 2nd to 8th October, 1949. During the week the whole College was busy with planting trees, digging manure pits and tilling the lands, etc.

On 26th January, 1950, the College celebrated 'Indian Republic Day'. Dr. S. W. Mensinkai hoisted the Flag and made a brief speech on the roll of people in a secular Sovereign Republic State. The whole College was fastidiously illuminated and decorated on that day.

Besides these official functions, the College celebrated its 3rd Social Gathering in December, 1949, with great jubilance

and enthusiasm. Hon-ble Shri M. P. Patil, Minister for Forests and Agriculture, was our Chief Guest. In his address, he appealed to the students to go back to the land and lead their country-men to achieve the goal of self sufficiency.

The Gymkhana activities began in right earnest with the opening of the College. Our College students played tournament matches and took part in inter-collegiate sports. The debating union was lively active throughout the year.

F. *Forestry College*

The Forestry College started in May, 1949. The Forestry classes were held in our College and most of the technical aid required for Rangers' course was given by our College staff. Besides, Sheep Breeding and Grass Breeding Stations have established on the College estate, which are under the administrative control of the Principal.

G. *Consumers' Co-operative Society*

This year a Consumers' Co-operative Society was organised in June, 1950. At present about 100 stationery articles are sold through the Society. Care is taken to meet the essential requirements of the students.

H. *Teaching Work.*

To facilitate teaching of each branch of science, there are 12 sections working in this College, viz.,

1. Agronomy.
2. Dairy and Animal Husbandry.
3. Horticulture.
4. Veterinary Science.
5. Agricultural Entomology.
6. Agricultural Botany.
7. Agricultural Engineering.
8. Agricultural Economics.
9. Bacteriology.
10. Agricultural Chemistry.
11. Plant Pathology.
12. Mathematics and Statistics.

Each section is in charge of a Professor. The following paragraphs give the work done by each section :—

(i) *Agronomy*—The staff consists of one Professor two Lecturers and five Demonstrators. Professor B. H. Patil was in charge of the section till Dr. H. R. Arakeri took over charge of the post on 18th September, 1949. The section is in charge

of teaching of Agronomy to all classes. It is also in charge of the College Farm. Net crop area under different crops was 771 acres and 26 gunthas. The total cost of cultivation was Rs. 72,370 and the total income was Rs. 94,760 showing profit of Rs. 22,390. During the period under report, there was a record of 20.20 inches of rainfall. The season was quite favourable for all crops, except paddy. Paddy crop suffered for want of heavy showers in the month of July. The season was exceptionally favourable for jowar and wheat crops. Besides, many crops, like sweet potato, potato, lucern, onion, brinjal, etc., were successfully grown as dry crops.

With a view to improving the land, the staff arranged for contour bunding over an area of 75 acres and arrange for clearing the land covered with shrubs and thorny bushes. The plantation of beetle vine and cocoanut is being done on the College farm, and in addition to it is proposed to try tree cotton on 12 acres of land with groundnut as inter crop. Some of the experiments carried out for teaching purpose are continued.

(*ii*) *Animal Husbandry and Dairying Section.*—Shri B. H. Patil was in charge of this section till the Principal took over charge of the section on the retirement of Shri Patil. The staff consists of one Professor, one Lecturer, one Manager and one Demonstrator. The staff was engaged in teaching the Animal Husbandry and Dairying subjects to all classes. The section also maintains a dairy, which consists of a herd of 16 local buffaloes, 7 Hariana cows with a breeding bull, and 12 cows with a breeding bull of Krishna Valley breed. The Krishna Valley herd was introduced with a view to improving the herd and also to comparing it with Hariana breed which is also a duel purpose animal of the North. The strength of animals including the young stock was 134. The fodder supply was fairly adequate and the general health of the animals was good. The total quantity of milk produced at the Dairy during the year was 77,064 lbs., of which 64,029 lbs. was sold to the customers, 948 lbs. was used for separation, 99 lbs. was used for laboratory and 11,988 lbs. was fed to calves.

(*iii*) *Horticultural section.*—The staff comprises one Professor, one Lecturer and one Garden Superintendent. The main work with the staff was to teach horticulture to B.Sc. (Agri.) class. The section was also in charge of 8 acres garden. Fruit plants, such as Basarai Banana, figs, chiku, mosambi santra, papaya, pomegranate, grapes, pines, pine apple, etc., were planted during this year and a regular fruit garden was

established. The existing mango plantation bore heavy crop after adequate treatment for hoppers and timely cultivation.

(*iv*).—*Veterinary Science section.*—Dr. M. M. Murgod was in charge of the section from the 9th May, 1949, to the 13th April, 1950. On his retirement, Dr. K. L. Shiggaon was appointed to officiate as Professor of Veterinary Science. The staff consists of one Professor and one Lecturer. The main work of the staff was to teach theory and practice of Veterinary Science to B.Sc. (Agri.) students. The section also runs a fairly equipped dispensary for treating the College herd as well as the farmers' cattle brought to the dispensary from the neighbouring villages. During the year under report a total number of 1,407 animals were treated for different diseases, of these 387 were from the College, 736 from neighbouring villages, 239 sheep and goat from the Sheep Breeding Farm and 45 from the Dharwar City. This gives an average attendance of 14 animals per day. Besides this, the College herd was taken timely care against seasonal diseases. During the year 141 bulls were castrated by the improved method.

(*v*) *Entomology section.*—The staff consists of one Professor, one Lecturer and one Demonstrator. The staff was engaged in teaching Zoology to the F.Sc. (Agri.) class and Entomology to the S.Sc. (Agri.) class. In addition to teaching, the staff has introduced Agriculture and Sericulture with a view to facilitating the teaching of these subjects. The staff helped local cultivators in controlling the crop pests. The staff toured in Karnatak to collect Zoology specimens and crop pests.

(*vi*) *Bacteriology section.*—The Professor of Bacteriology assisted by the Lecturer in Bacteriology taught Agricultural Bacteriology to the S.Sc. (Agri.) throughout the year. The section had also undertaken the study of the root nodule bacteria, bacterial flora of field soils and phytopathogenic bacteria.

(*vii*) *Engineering section.*—The staff consists of a Professor and a Lecturer. The section was in charge of teaching Agricultural Engineering to the S.Sc. (Agri.) and B.Sc. (Agri.) classes. In addition the section was responsible for teaching the subjects of surveying and Drawing to the Forest Rangers Class.

(*viii*) *Mathematics and Statistics section.*—The staff comprises of one Professor, one Lecturer and one Demonstrator.

The staff taught Physics, Meteorology, Biometry and Mensuration to the F.Sc. (Agri.) class and field plot technique to the B.Sc. (Agri.) students and Meteorology to Forest Rangers Class. In addition to this the staff recorded weather data maintained in the Agricultural Meteorological Observatory attached to the College.

(*ix*) *Botany section.*—The staff comprises of one Professor, and Lecturer and two Demonstrators. The staff was engaged all the year round in teaching Agricultural Botany to the the F.Sc. (Agri.) and B.Sc. (Agri.) classes. In addition, the staff taught botany to the Forests Rangers Class as it was one of the major subjects of their study. The section maintains a herbarium and a four acre plot to facilitate the teaching of the subject.

(*x*) *Chemistry section.*—Dr. N. Narayan was in charge of the section till Professor M. A. S. Iyengar took over charge of the post of Professor of Chemistry on the 4th September, 1949. The staff consists of one Professor, one Lecturer and three Demonstrators. All the staff was engaged in teaching Geology, Soil Physics and Inorganic and Organic Chemistry to the F.Sc. (Agri.) class and Agricultural Chemistry to the B.Sc. (Agri.) class.

(*xi*) *Pathology section.*—The Professor assisted by a Lecturer taught Plant Pathology to the B.Sc. (Agri.) class. In addition, the staff keeps a regular watch on the appearance of any disease on the College Farm.

(*xii*) *Economics section.*—The staff consists of one Professor and one Lecturer. The main work of the section was to teach Agricultural Economics to the B.Sc. (Agri.) and S.Sc. (Agri.) classes. The staff complied weekly prices of agricultural produce sold in Dharwar Market.

V. C. PAVATE,
Principal,
College of Agriculture,
Dharwar.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) To continue the teaching of various Agricultural Sciences.
(2) To introduce the four year course leading to B.Sc.(Agri.) degree.
(3) To introduce the Post-graduate courses leading to M.S.C. (Agri.) and Ph.D., in almost all branches of the Agricultural Sciences.
(4) To carry out research work in different sciences.
(5) Development of the farmland.

V. C. PAVATE,
Principal,
College of Agriculture,
Dharwar.

APPENDIX III

Summary of work done under the Plant Pathologist to Government, Bombay State, for the year 1949-50

A. *Staff and Administration*

There was no change in the staff.

B. *Research Work.*

1. Scheme for breeding wilt resistant varieties of cotton.—The scheme financed jointly by the Indian Central Cotton Committee and the Government of Bombay is meant to assist the Cotton Breeders in isolating wilt-resistant varieties of cotton for their tracts. The work is carried on at Poona, under standard conditions.

(*a*) *Broach Section*—Progenies of hybrid selections 66-60-3, 66-60-5 and 72-47-26 of the cross (1027 × B.C. 1-2) F7 and 98-24-11, 98-41-10 and 189-58, BK-21 of the back-cross, viz., B.C. 1-2 × (1027 × B.C. 1-2) F6 showed very high resistance.

(*b*) Surat Section—Progenies of 2 cultures, 2266-1-4-3 of the cross (8-1 × B.C. 1-6) F 11 and 3652-22-2-11 of the cross (1027 × B.C. 1-6) F11 showed mortality not exceeding 10 per cent. Of the new cultures, viz. 1864, 2010, 2087, 2272 and 2334 tested, culture 2087 seems promising.

(*c*) *Khandesh Section*—Progenies of Dokras 9-2-8-3-3-5-1 and 2 families of (370-4 × Dokras) are promising.

(*d*) *Dharwar Section*—Some progenies of the cross (K.F. ×R), the back-cross (K.F. × Jarila) × K. F. and sub-cultures of Jayadhar remained almost free from mortality.

2. *Plant Virus Research Scheme.*—Several diseases previously attributed to unknown reasons are now shown to be of virus origin, and it has been possible to devise measure for controlling some of them.

(*a*) *Yellow vein mosaic of bhendi.*—Trials on the control measures as in previous years, were repeated in a radius of 3 miles during April and May and bhendi sown on the Agricultural College Farm during the first week of July in a 20 guntha plot. Weekly observations were begun in July and continued upto September, when all the diseases plants were uprooted. By the end of season, a total of 745 diseased plants out of an initial population of 23,065 were destroyed whereas in a 7 guntha private plot, 67 per cent of the crop was affected.

(*b*) *Katte disease of cardamom.*—Measures for controlling Katte disease in a block of 100 acres in North Kanara show that so far not a single diseased cardamom has been observed in the cleaned area. The total number of plants transplanted in their permanent pits in these gardens is:—

13,000	2½ years old.
8,000	1½ years old.
4,000	1 year old.

In addition, about 6,000 seedlings shall be transplanted in 1951. A scheme to extend the work to the entire area has been sanctioned by Government.

(*c*) *Papaya mosaic.*—It is proposed to apply the Insect Pests and Diseases Act to areas affected with papaya mosaic in Poona district, Bombay and Suburbs after a thorough survey. As a result of survey at Theur in a 20-acre papaya plot with 9,000 plants in November, 240 diseased plants were destroyed and the remaining sprayed with fish-oil rosin soap and DDT. The plot was again surveyed in December when only 15 diseased plants were destroyed, and the plot given a second spray. In February, 112 diseased plants were destroyed, thus showing that the spread of the disease has been considerably checked.

(*d*) *Bunchy top disease of banana.*—This serious disease was first noticed at Kothrud and Manjri Farm in November, 1949.

Later, it was observed at Jalgaon, Shendurni, Phaltan, Bardoli and Surat. From the information available, it appears that the disease has been introduced through banana suckers imported from East Khandesh.

Attempts to exterminate the disease from the Bombay State are being worked out.

3. Black stem rust of wheat.—Seedling and adult resistance tests—of the 39 varieties of wheat obtained from Australia and New Delhi, strain 88 is found to possess very high resistance to all the 10 races of stem rust occurring in India. K. G. P. F. Nos. 4508, 4521, 4652 and 4676 and E. 845 are highly or miderately resistant to these races while 8 more varieties are susceptible to 42B only.

C. 217, a wheat variety reported to be resistant to rust in East Punjab was found highly susceptible.

N. P. 710 and N. P. 715 were found to be rust tolerant.

Of the 53 wheat varieties belonging to *Triticum*, 18 species of *Aegilops* and 10 species of *Agropyron* received from the Cytologist, Poona, when tested under field epidemic, 5 of *Triticum* (Charter, Gabo, Iumillo and H. R. Spring types), 3 species of *Aegilops* and all Agropyron spp. were found resistant. T. *timopheevi* is highly susceptible to new race B.

Mature plant resistance test—Of the 234 single plant selections of 5 crosses and 213 selections of 9 crosses in bulk stage, 130 single plants and 137 bulks were found pure for resistance. The rust-resistant selections in bulk stage mostly comprise those from (Kenya E 144 × Niphad-4), (Hofed 1 × Niphad 4) and their reciprocals and (Mondhya 417-5 × Hofed 1).

Rust resistant individuals were also selected from the F2 progeny of (1) Jaya × Hofed 1, (2) Gulab × Hofed 1, (3) Vijaya × K. E. 144, (4) Kenya E. 144 × Gulab, and (5) Mondhya 3-2 × K. E. 144.

Of the 19 samples of rust from Bombay State, race 21 was present in 15 (either alone or in combination) and race 42B in 5. Races 40 and 42 were also present.

4. Other Schemes.—Verticillium wilt in brinjal—Of the progenies of 16 plants selected last year comprising, 5 varieties and those selected at Khopoli when further tested showed that the progenies of Improved New York, Round Black, All Season Round were resistant in pot tests.

Tur wilt.—Some selections from M7-7 and M7-4 show high degree of resistance to wilt.

Gram wilt.—Selections from cultures Dohad 1 and Nagpur 352-4' and the strain 118-12' show first 2 to be promising while the latter being susceptible is rejected.

5. Departmental Research Work.—(*a*) *Cotton root-rot*—A preliminary experiment to control cotton root-rot by growing math (*Phaseolus aconitifolius*) thickly between the rows of cotton shows the mortality to be 0.4 per cent in the treated plot as against 4.2 per cent in the control. Pathogenic cultures of *Alternaria, Helminthosporium* and *Rhizoctonia* have been isolated from cotton leaves.

(*b*) *Blast disease of rice*—Coimbatore 3912, 3892, 3840 and Bhadas maintained their resistance. Spraying perenox (1½-50) on seedlings in seed beds and dipping the seedlings before transplanting considerably checked further spread of the disease.

(*c*) *Seedling blight of wheat*—T. M. T. D., Spergon, A. A. grano and sulphur show that the first two besides controlling the disease give higher stand.

(*d*) *Loose smut of wheat*—Solar heat treated seed when tried at Pakhajan, Jalgaon, Niphad, Poona and Dharwar gave very encouraging results in as much as 1½ and 2 hour exposure gave complete control of loose smut as against 3.6 to 6.6 per cent infection in the non-treated seed. No adverse effect on germination is noticed.

(*e*) *Guava canker*—Guava canker (*Pestolotia psidii*) mainly attacks green fruits. Of the several varieties tested for their reaction, Lucknow 49 was found highly susceptible.

(*f*) *Foot rot of ginger*—Due to heavy rains experiment at Amalsad was vitiated.

(*g*) *Nematodes in Piper longum*—DD, Killoptera and Methyl Bromide when injected into soil at the rate of 10 ml. per feet show effective control.

(*h*) *Rust on sugarcane*—Sugarcane Co 475, received from Deccan Canals showed infection by *Puccinia* sp. The telial stage is recorded anew and it is, therefore, named *Puccinia sacchari* sp. nov.

(*i*) *Tikka disease of groundnut*—6 varietits of groundnut from Coimbatore and one field selection made at Poona, seem to resist the disease.

(*j*) *Effect of seed-dressing on germination and control of jowar smut*—T. M. T. D. and A. A. grano give 20 per cent more stand besides controlling the smut.

(*k*) Downy mildew of jowar—A green ear stage and malformed earhead symptoms of jowar mainly due to *Sclerospora* have been noticed at Poona and Surat.

(1) Bacterial Diseases of Plants.—The genetics of resistance to angular leaf-spot of cotton in a cross between K. F. (highly resistant) and Russian 22 (Highly susceptible) when studied in F1, F2 and back-crosses show that susceptibility is partially dominant. Heavy to moderate infection on Jarila, Dokras Gaorani and 197-3 was noticed at Jalgaon. A new bacterial pathogen on leaves of *Xanthium strumarium* was named *Xanthomonas badrii* sp nov. Leaf-spot pathogens on alfalfa chillies new to India are found identical with *X. alfalfae* and *X. vesicatoria* Three more bacterial leaf-spots, viz. of castor, begonia hitherto unreported in India and of *tur* new to science are recorded, bringing the total of bacterial diseases of plants reported from this laboratory to 17. Studies are undertaken to classify *Xanthomonas* spp by agglutination and other physiological tests A thermophilic organism (988) from rotting tomatoes and onions has been isolated An easy, convenient and unfailing method of flagella staining has been evolved in this laboratory

C *Advisory and Development Work*

A number of enquiries pertaining to plant diseases and their control, dusting and spraying appliances and issue of phytopthological certificates were attended to. One student obtained M Sc. (Agri) in Plant Pathology.

M. K. PATEL,
Plant Pathologist to Government,
B. P., Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Work on the isolation of wilt resistant varieties of cotton, tur, gram, brinjal and leaf-spot fungi will be continued.

(2) Work on virus diseases of vinca, sesamum, sann-hemp, papaya, isolation and purification of virus protein, cross immunity tests, virus-vector relationship and survey of virus diseases will be continued.

(3) Work on testing of wheat strains and hybrids for rust resistance will be continued.

(4) More rice varieties from Madras, Cuttack, Bombay State and the crosses from the Deputy Director of Agriculture (Crop Research), will be tested for resistance to blast.

(5) The experiment for the control of foot-rot of wheat will be repeated using T. M. T. D., Agrosan G. N. and Spergon only.

(6) Work on morphology, physiology of rust on sugarcane and varietal resistance will be continued.

(7) It is proposed to test 61 selections of groundnut against tikka disease at Jalgaon, Poona and Karad.

(8) Work on new bacterial diseases will be continued.

M. K. PATEL,
Plant Pathologist to Government,
B. S., Poona.

APPENDIX IV

Summary of the work done under the Agricultural Chemist to Government, B. S., Poona for the year 1949-50

A. *Staff and Administration*

Dr. J. A. Daji was transferred to the post of Deputy Director of Agriculture (Research and Education), Poona and Dr. N. Narayana, Professor of Chemistry, College of Agriculture, Dharwar, took over charge of the office and laboratories of the Agricultural Chemist on the 17th September, 1949. Dr. H. G. Pandya, Dr. M. M. Kibe and Shri S. S. Abhyankar continued to work in their respective posts during the year under report.

B. *Analytical and advisory work*

Total number of samples received during the year were 1177 of which only 59 were received from the public. 10 samples had to be rejected because of the inadequate information supplied with the sample. Total number of samples analysed during the year was 715, of which 239 were from the previous year, leaving a balance of 758 samples in arrears. The special concessional rates given to the *bona fide* cultivators according to G. R. A. & R. D. D. No. 2543, dated the 3rd March, 1949, continued during this year also.

C. *Agricultural Education*

The College Expansion Scheme was continued during this year also, but, as the number of students had gone down, laboratories were not working until late hours in the evening. Of the seven post-graduate students working for the last year, three finished their laboratory work and were writing the thesis. Two fresh students were admitted for post-graduate degrees. Two special students were trained in Dairy analysis during the year.

D. *Research work*

The manurial experiments on grass lands at Palghar were terminated during the year. On analysing the different varieties of grasses, receiving various manurial treatments, no very characteristic difference were noticed. All varieties appear to have been benefitted to the same extents. A few of the promising treatments were applied this year, on 100 acre plots to ascertain their effect on mass scale. The results are being studied.

The investigations into the preparation of activiated carbon from rice hust, etc., were also terminated during this year. The extension proposals for the scheme were not sanctioned. Activation trials on the small laboratory furnace were completed. It was found that under specified conditions carbon preparation could be activiated to the desired extent, either with super heated steam or carbon-dioxide. Construction of the activation furnace on pilot plant scale was also completed.

On further trials, it was found that the acid extract of whole bones, could be advantageously dried in air after mixing with farmyard manure. It leaves most of the phosphoric acid in soluble condition and the air drying of the mass is quite simple.

Investigations on the nutritional requirements of rice plant were continued. In the soil culture experiments 100 lbs. of nitrogen per acre given as sulphate of ammoniam three equal doses, i.e., transplanting, tillering and flowering stages has given higher dry matter than 0,25 and 50 lbs. of nitrogen per acre, thus corroborating the first year's findings. In the water culture experiments, using three different levels of N, P and K, it was noticed that the total dry matter height of plants and the water transpired was highest with the lowest level of nitrogen (i. e., 50 ppm.) and lowest with highest level of nitrogen (i.e. 200 ppm.) the uptake of N and P by the plant increased with increasing doses of N and P supplied.

The water culture experiments using the basic Hoagland's solution are being continued and it is proposed to analyse the plants as well as the unused culture solutions at various stages of growth in order to study the N, P and K requirements of the rice plant at different stages. Similarly a number of soil culture experiments are being taken up in plots in order to study various aspects of manuring of paddy such as the form of N, the form of P, the best combination of N and P, the best time of application of N, the effect of minor elements, the loss of lime by the application sulphate of ammonia etc.

Investigations into the nutritive value of improved varieties of crops were continued. Digestibilities of the protein and starches of the three varieties of grams were found not to differ appreciably. Digestibilities of starch and chemical analysis of 16 varieties of jowar, were completed.

Work on the preparation of fuel gas from cattle dung was in progress. Addition of different nutrients to the fermenting medium was not very effective in increasing the production of gas. Buffering the medium to PH 7.5 with sodium bicarbonate was found to increase the gas production appreciably. Large scale trials on a suitably constructed plant were carried out. It was found that 150 lbs. of dung produced on an average 7.2 cft. of gas per day during summer while during winter, gas production was reduced to about 1′ cft. per day. Residue left over after fermentation was found to suffer no loss of nitrogen. Nitrification trials of the residue are in progress.

Studies on the mottle leaf disease of citrus plant, did not make satisfactory progress during the year. This was partly due to the sudden wilting of the plants under observations. It was however found that the disease could be brought under control by applying zinc spray to the plants.

Studies on the effect of oil on the nitrification of cakes, were completed. It was found that oil exceeding 10 per cent appreciably retards nitrification in the early stages.

Studies on the hydrolysis of oil with pure strains of some fungi and on the oxidation of ghee, were completed. It was found in the former case that the fungus Awamore Nakas could hydrolyse groundnut, oil to the extent of 84 per cent within five days under the specified conditions.

Studies in the preparation of papain have been started under a scheme sanctioned by the Sir Sassoon David Trust Fund.

N. NARAYAN,
Agricultural Chemist to Government,
Bombay Province, Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

Studies on the problems mentioned under research will be continued. It is also proposed to make a detailed study of the soils of the College Estate.

N. NARAYAN,
Agricultural Chemist to Government,
Bombay Province, Poona.

APPENDIX V

Summary of the work done under the Horticulturist to Government, B. S., Poona, for the year 1949-50

A. *Staff and Administration*

Shri S. R. Gandhi held charge of the Section throughout the year. Shri I. A. Sayed, Assistant Horticulturist, (PWRS), supervised the working of the Post War Reconstruction Scheme No. 15 and also functioned as the Inspector of Fruit Products in the Fruit Products Control order scheme. Shri B. A. Nazareth, Assistant Horticulturist to Government, unfortunately died on the 22nd October, 1949, and Shri N. Gopalkrishna was appointed to act in his place.

B. *Agricultural Education*

The Horticulturist to Government, B. S., Poona, was assisted by the Lecturer in Horticulture in the teaching of Horticulture at the College of Agriculture. Of the 177 students, who appeared for horticulture at the B.Sc. (Agri.) examination in March 1950, 173 passed. During the year, five post-graduate students were working in the Section for the M.Sc. degree in horticulture and one of them has completed his thesis for submission to the University of Poona.

In the Horticultural Training Class at the Ganeshkhind

Fruit Experiment Station, Kirkee, 29 students were trained, of whom 4 belonged to the Backward Class communities.

A fortnightly class in Fruit Preservation for Ladies was started from the 1st January, 1950, at the Horticultural Laboratory of the College of Agriculture, Poona. In this class as many as 100 students were trained between the 1st January 1950 and the 30th June, 1950. Another one month course in gardening for ladies will also be started on the 1st July 1950, at the Modibag garden of the College of Agriculture, Poona. The duration of the class is only one month during which elementary practical knowledge will be imparted in fruit, flower and vegetable gardening.

C. *Agricultural Research*

(1) *Research at the Ganeshkhind Fruit Experiment Station, Kirkee.*—Citrus Root-stock experiment—This experiment was started in the year 1943 to find a citrus root-stock resistant to Mottle-leaf of mosambi orange and also to study the effect of different stocks on the yield and quality of mosambi fruits. The root-stocks under study are jamburi, karna, sadafal, galgal, sweet chikna, sharbati and kagadi lime. As reported in the previous years, in point of general health and vegetative vigour and yield performance, mosambi on jamburi and sharbati lemon continued to be vigorous as compared to its growth on other root-stocks. The mosambi on sweet chikna developed most mottling as in the past. It is now concluded that different root-stocks show varying degrees of resistance to mottle-leaf and that no stock is superior to the local and jamburi (riugh lemon) in point of utilising the minor element sinc from soil, the deficiency of which in the plant is known to bring about mottle-leaf or foliocellosis. It was therefore decided to adopt a spraying schedule usually adopted in California, U. S. A., to combat this disease on orange trees. A spray consisting of 10 pounds of zinc sulphate and 5 pounds of hydrated lime to 100 gallons of water was applied to the mosambi scions on different root-stocks in their dormant state in January, a month before their spraying flowering. It was observed in the following April and later that not only the sprayed leaves on older growths improved in colour, but the new leaves on younger growths, turned out to be completely green without the slightest trace of mottling. Further trials of spraying with zinc sulphate will be undertaken in the same orchard in the near future.

(ii) Chiku root-stock experiment.—The object of the experiment is to find out the difference in growth, quality and yield between the chiku trees propagated (1) by layering, i.e., on own roots, (2) by grafting on Rayan (mimusops hexandra) root-stock and (3) by grafting on chiku root-stock.

The experiment was laid out in 1945-46 and comparative observations on the growths of layers and grafts are being made.

The chiku layer maintains the lead in vegetative vigour over the other combinations as reported last year. The chlorosis developed by chiku grafted on Rayan root-stock is being studied. It seems that this chlorosis is a lime induced chlorosis and is caused by lack of iron in the plant tissues. The trunks of chiku trees badly chlorotic in appearance were injected with 0.1 gram of ferrous citrate and they began to show improvement in colour within a fortnight and regained almost 75 per cent of their former greenness after 30 days of application. Further observations on the injection of ferrous citrate and its effect on the chlorosis of chiku will be made during 1950-51.

(2) *The Grape-vine spacing and training experiment.*—The object is to study the effect of close spacing and different systems of training on wire trellis on the growth and yield per acre of bhokri grape vine. The orchard was planted in February, 1949, and it yielded its first crop in April, 1950. The double standard vines spaced at 8′×2′ topped all other systems in point of outturn per unit space. The quality of fruit, however, was just the same in the case of all the spacing tried in the experiment.

Grape-vine variety trials.—These trials are being conducted at the Agricultural Research Station, Padegaon. The plantation is five years old. The names of varieties are Gulabi, Karachi, Banglore Purple, Thomson Seedless, Malta, Bhokri, Phakdi, Selection No. 94, Pandhri Sahebi and Selection No. 7. From the view point of both yield and quality, Gulabi is the most promising. Kandhari, Malta and Pandhri Sahebi are shy bearers. Selection 7, which was selected from a number of Pandhri Sahebi seedlings, through capable of bearing full size bunches bears very spares crops like the parent. The Selection 94, which is a selection from Phakdi seedlings, is a very prolific bearer and is a distinct improvement on the parent plant as it gave on an average 10 lbs. crop per plant

as against 4 lbs. in the case of Phakdi and 9 lbs. and 14 ozs. of Bhokri. The juices of Gulabi, Banglore Purple, Karachi and Bhokri were bottled on a large scale and are kept in cold storage for further observations. During the course of our observations it is found that Karachi and Banglore purple yield a thick purple coloured sweet juice which is much prized by the people as a beverage and tonic. The juice of Bhokri is thin, light coloured and more acid. The economics of bottling grape juice of each variety is also being worked out.

The Banana Manurial Experiment.—This experiment was closed as the results from the past experiments were finally concluded that 40 lbs. of farmyard manure and 5 lbs. of castor cake per plant was the best manure to get maximum yield of Basarai banana spaced 6 feet apart.

The Banana cultural experiments.—The object is to ascertain the size or age of the suckers of Basrai banana at the time of planting so as to get the maximum yield in the shortest time possible. Observations were made on the progressive development of a series of suckers around the mother plant and an orchard has been planted out with suckers of different ages and development or size. The results will be reported in 1951.

Nurseries.—The mango bud graft, citrus, guava and other plant nurseries were planted on a sufficiently large scale to meet the demand for improved plants from all over the State. In 1949, 12,422 fruit plants and 2,684 ornamental plants were sold from the Ganeshkhind Fruit Experiment Station, Kirkee.

New Introductions.—The avocado plants were multiplied for opening a plantation on a sufficiently large scale at the Ganeshkhind Fruit Experiment Station. The avocado shows distrinct signs of alternate or biennial bearing just like the mango. The litchi plants of the Purbi variety planted in 1949 are making a slow progress and the ten-year old trees of the Rose variety bore a small crop which was unfortunately damaged by hailstorm in May 1950. The citrus varieties—Washington Navel, Late Valenchia and Wheeny grape fruit imported from Australia in 1948 and rared in posts for a year, were planted in their permanent quarters in the monsoon of 1949 and are doing well. Amongst the newly introduced grape varieties, the Gulabi showed great promise.

D. *Extension, Propaganda and Advisory work*

During the monsoon of the year 1949, 1,483 mango trees of inferior varieties belonging to private fruit growers in different

parts of the State were converted into superior varieties by grafting in situ free of charge. As a result of this campaign, there was a province wide demand for extending this activity more intensively in the principal mango growing areas of the State. To meet this demand a scheme has been launched in 1950 to graft 20,000 mango trees in situ in Gujarat, Konkan and Karnatak within a period of 5 years at a total cost of Rs. 25,260. Another similar scheme has also been put into action, especially for the Poona district. This scheme is sponsored and financed by the District Rural Development Board from their district procurement prize and is designed to graft 6,000 mango trees and 6,000 bor trees during the year 1950-51 at a total cost of Rs. 10,000. During the year under report, demonstrations in methods of plant propagation and fruit preservation were given at 10 Agricultural Shows held in different parts of the State.

The season proved to be very favourable for the cropping of the mango and the grapevine all over the State. The bananas in the Deccan and Khandesh got a serious set back due to cold waves during January, 1950, and the mangoes and grape crops in the some parts of Deccan and Gujarat suffered a heavy loss due to violent hail storms that occurred in April, 1950. The area under papaya considerably decreased in the Poona and Thana districts due to a virus disease which is under investigation by the Plant Pathologist to Government. The area under banana in East Khandesh and Surat was also affected adversely to some extent due to the prevalence of bunchy-top disease which seems to have been inadvertently introduced recently by some cultivators, who may have brought diseased suckers from South India. Arrangements are being made to check both the viruses in collaboration with the Pathological Section.

The demand for coconut seedlings is great in all the rainy tracts, of the State on the West Coast. The total number of seedlings distributed during the year from the Coconut Nursery at Kumta was 6,520, and 2,905 seedlings were also supplied to Thana and Kolaba from the Central Nursery at Kosbad (district Thana). Besides, sanction has been received from Government for the establishment of a Regional Coconut Research Station for Bombay State at Ratnagiri, which will be partly financed by the Indian Central Coconut Committee. For the extension of arecanut and cashewnut on the West Coast of Bombay, two new schemes have been submitted to Government & the Indian Council of Agricultural Research Scheme for

research on bananas was brought into operation by establishing the Banana Research Sub-station at Kopargaon, (district Ahmednagar) during the year under report.

Numerous enquiries about the suitability of sites for fruit cultivation have been dealt with and arrangements were made to supply reliable fruit trees from the Government gardens and nurseries established in different parts of the State. 15 lbs. of pure seed of Washington papaya was collected and distributed all over the State. Over a thousand grafts of guava Lucknow-49 were distributed from the Ganeshkhind Fruit Experiment Station, Kirkee, and similarly some promising varieties of grapevines were selected from our collection and their plants raised with a view to introducing them in Nasik and Baramati areas.

E. *Establishment of Central and Subsidiary Nurseries*

Under the Post War Reconstruction Scheme No. 15, 94,250 fruit tree grafts and seedlings were raised on the 14 nurseries established so far in different parts of province. The new nurseries at Bagalkot, district Bijapur, Kolad, district Kolaba, and Nasik will be opened in 1950. The nursery at Nandgaon (Taluka Planning Scheme) produced 2,975 mango grafts, which are to be distributed in the Kankavli, taluka of the Ratnagiri district. The nurseries at Gandevi, Baroda, Dhari and Kodinar from the Baroda State came into our possession since August 1949, and they are being re-organised.

F. *Tree Planting scheme*

Arrangements were made to grow about a lac of shadetree and fruit tree seedlings of various kinds in all the Government Gardens and nurseries for distributing them free to the public during the tree Planting week in the following monsoon.

G. *Enforcement of the Fruit Products order of 1948 in the Bombay State*

During the year under report, the Inspector inspected the premises of 66 manufacturers, of whom 46 were granted licenses for the manufacture of fruit products.

H. *Publications*

The leaflet No. 6 of 1939 on the cultivation of Pipe apples was received. The following papers were read at 37th session of the Indian Science Congress from the Horticultural Section.

(1) "Effect of Buttress Grafting on Growth and Development of Orchard Trees" by S. R. Gandhi, M.Ag., and (2) "Origin of adventitious roots in the stem of Morus indica" by D. B. Surti, B.Sc. (Agri.).

S. R. GANDHI,
Horticulturist to Government,
Bombay State, Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

Besides the permanent experiments on citrus, chiku, grapevine and banana at the Ganeshkhind Fruit Experiment Station, Kirkee, the Post War Reconstruction Scheme No. 15, and the Sidegrafting Scheme for mango, the Coconut Nursery Scheme, the Banana Research Scheme, the Horticultural Training Classes, and the Work under the schemes of the Fruit Products Control Order will be continued during the year 1950-51.

S. R. GANDHI,
Horticulturist to Government
Bombay State, Poona.

APPENDIX VI

Summary of the Work done under the Economic Botanist to Government, B. S., Poona, for the year 1949-50

A. *Staff and Administration*

Shri L. S. S. Kumar continued as Economic Botanist to Government, B. S., Poona. Dr. S. Solomon continued as Assistant Professor of Botany, except for a period of six weeks from the 7th May, 1950, to the 17th June, 1950, when he was on leave. Professor U. K. Kanitkar continued as Assistant Professor of Plant Physiology, and Dr. G. B. Deodikar as Cytologist in the scheme for establishment of a Cytological Laboratory. Dr. S. W. Mensinkai was appointed as Fibre Development Officer from the 1st May, 1950.

B. *Botanical Work on grasses and forage legumes*

The scheme for the improvement of grasses and leguminous fodder crops has completed two years. The experimental site,

Lino.—S 1314—6

which was located at Manjri, has been shifted to Dharwar in June, 1950. The following is a summary of work done under each item:—

(1) *Yield trial of exotic grasses and legumes.*—*Setaria* sp., Guinea grass and thin Napier grass yielded more than the local *Marvel*. *Shevra* (*Alysicarpur rugosus*) gave a higher yield than other legumes.

(2) *Establishment of acclimatization plots at various Agricultural Schools.*—Trials at 11 Schools showed that Rhodes, Blue Panic and Thin Napier among the grasses and *Centrosema pubescens* among the legumes are promising.

(3) *Improvement of indigenous grasses and legumes.*—It was observed that *Marvel* is composed of three district botanical species. Individual selections of promising types within each species have been made this year. Among the legumes, a few selections of *Barbada* (*Indigofera glandulosa*) and *Shevra* (*Alysicarpus rugosus*) having a longer vegetative period have been made.

(4) *Methods of reseeding grasslands and establishing balanced swards.*—This was the first year of the experiment and the results are inconclusive.

(5) *Production of seeds of forage crops for distribution.*—Large quantities of seeds of the promising grasses and legumes were collected to meet the demands of the public. About 28 lbs. of cleaned grass and 36 lbs. of legume seeds were supplied to interested parties during the year.

C. *Weed Control*

A field scale trial for the control of *Striga* attack on *Jowar* by the use of 2, 4—dischlorophenoxyacetic acid (2, 4-D) was undertaken at Hirekudi in Chikodi taluka of the Belgaum district. A good proportion of the *Striga* was suppressed, but the differences in the yield of grain and fodder of *jowar* between treated and untreated plots were not statistically significant. *Lantana camera*, a woody shrub was effectively controlled by cutting back and spraying the fresh tender growth with a 1 per cent solution of 2, 4-D.

Encouraging results have been obtained in preliminary trials for the control of *hariali* (*Cynodon dactylon*) a perennial weedy grass, by the use of sodium trichloracetate. The optimum dose was 100 lbs. sprayed at the rate of 400 gallons per acre.

D. *Striga Research Scheme*

The main object is to evolve homozygous strains of *jowar* resistant to *Striga*. Progenies of individual plants selected from hybrids of various crosses between local varieties and Bonganhilo or Burma Y. K., resistant to the attack of *Striga* and possessing desirable characters were grown at different centres in the Bombay State, during 1949-50. The season was extremely unfavourable at Annigiri and Mohol and the experimental *jowar* crop almost failed at these centres. At Poona, Karad, Viramgaum and Surat, the attack was between 50 and 98 per cent in the susceptible checks. At Dharwar, Bailhongal and Jalgaon, *Striga* appearance was from 10 to 30 per cent. A few very promising hybrid cultures in F5 and F6 generations have been obtained at Poona and Surat.

Experiments carried out at Surat Farm to control *Striga* attack by the use of hormonal weedicides showed that two applications of 0.1 per cent Fernoxone applied 8 to 10 weeks after sowing the *jowar* crop effectively controlled the growth of *Striga*.

E. *Cytogenitics*

An extensive and valuable collection of wild relatives of cereal, pulse and oilseed crops has been made and is being maintained for furnishing suitable material in producing new types by hybridization. A triploid wheat has been anthezised by crossing a diploid and tetraploid wheat for developing rust resistant types of wheat. Three new introduced types of *Sorghum* have proved resistant to *Striga* in preliminary trials.

F. *Plant Physiology*

Promising results were obtained in the prevention of post-setting fruit drop of Alphonso mango by the use of growth substances. It was found that spraying newly set fruit (about 15 days old) with 25 p.p.m. of 2, 4-D and Naphthalene Acetic acid definately lowers the drop of fruit by 25 to 40 per cent, thus resulting in a much higher yield of mature fruit as compared to untreated controls.

Experiments on the effect of indolyl acetic acid, naphtalene acetic acid and 2, 4-D on the ripening of bananas were performed during the winter and summer. In the cold weather, bananas treated with 2, 4-D ripened in 4 days, those treated with the other two substances ripened in 7-8 days whilst the

untreated controls took 10-12 days. In the hot weather, however, the treated fruit ripened on the 3rd day while the untreated fruit ripened after 4-5 days.

Stimulation of seed germination and increase in yield have been recorded by treatment with very low concentrations of 2, 4-D in wheat and gram. In wheat (Pusa 4), when the seed was treated with 1 p.p.m. and 10 p.p.m. for 2 hours, the rate of growth and the tillering was increased. 0.1 p.p.m. for 20 hours gave a statistically significant higher yield than the control. In gram, concentrations between 0.001 p. p. m. and 1 p. p. m. gave acceleration in seedlings and vegetative growth. As far as yield is concerned, 1 p. p. m. for 12 minutes and 2 hours and 0.01 p. p. m. for 20 hours resulted in higher yields than the control.

L. S. S. KUMAR,
Economic Botanist to Government,
B. S., Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) *Botanical Work on grasses and forage legumes.*—(*a*) Selected plants of *Marvel, Barbada,* and *Shevra,* will be studied in progeny rows.

(*b*) Study of balanced seed mixtures and reseeding methods will be continued.

(*c*) Yield trial of exotic grasses will be continued.

(*d*) Establishment of trial plots at various Cattle Breeding Stations will be undertaken. Agricultural Schools will be developed into centres of seed supply of promising grasses and legumes.

(2) *Weed Control.*—(*a*) Trials for the control of *hariali* with TCA will be repeated.

(*b*) The residual effect of TCA on different crops will be studied.

(*c*) Methods of controlling *Lantana Camera* by the use of weedicides will be studied.

(3) *Striga Research Scheme.*—Testing of the more promising hybrid cultures in the *Striga* sick plots in the districts and

in plots in Poona will be continued with the object of isolating pure types possessing high resistance to *Striga* and the desirable economic characters.

(4) *Cytogenetics.*—(*a*) Reciprocal backcrosses of the triploid hybrid of Niphad and Gaza wheats with a view to obtain chromosomal stability in a shorter period.

(b) Hybridization of *T. Timopheevi* with *vulgare, durum* and *dicoccum* strains of Bombay wheats.

(c) Testing of the wild forms against the major diseases of the respective cultivated crops with the co-operation of the Plant Pathologist.

(*d*) Cytological examination of the hybrids, back crosses and mutants.

(5) *Plant Physiology.*—(*a*) Effect of treatment of seed with 2, 4-D on growth and yield in Rice, Wheat, gram, safflower, groundnut and *jowar.*

(*b*) Ripening of fruit—Further work on effect of growth substances will be undertaken.

(*c*) Relation of absorption of NPK and water by Pusa 4 wheat to various NPK levels.

(*d*) Preliminary investigations on running to leaf sponginess and shedding in rice, and sugary disease in *jowar* will be undertaken.

(6) *Fibre Crops.*—(*a*) *Jute*—Seed collected locally and that obtained from West Bengal will be distributed to interested parties in the districts of the Konkan, Belgaum, Satara, Kolhapur and Surat.

(*b*) *Ambadi.*—About 10,000 acres will be put under this crop during 1950-51.

(*c*) The possibilities of growing *Urena* sp., *Malachra* sp., *Abutilon* sp. and *Sida* Sp. as substitutes for Jute will be studied at the Agricultural College, Poona.

L. S. S. KUMAR,
Economic Botanist to Government,
B. S., Poona.

Appendix VII

Summary of the work done under the Agricultural Entomologist to Government, B. S., Poona, for the year 1949-50

A. *Staff and Administration*

Shri L. S. S. Kumar, Principal, College of Agriculture, Poona, continued to hold charge of the post of Agricultural Entomologist to Government up to the 18th May, 1950. Afterwards Dr. G. A. Patel was appointed Agricultural Entomologist to Government with effect from the 19th May, 1950.

Shri P. M. Varma, Virus Entomologist was entrusted with the teching work in Entomology during the period. Shri L. S. S. Kumar held charge of the post of Agricultural Entomologist.

The main activities of the Entomological section consists of (1) Teaching at the Agricultural College, Poona, (2) Investigations regarding the control of Agricultural crop pests and stored grain insects, (3) Advisory work on insect pest control etc. (4) Research work financed by the Indian Council of Agricultural Research, Indian Central Sugarcane Committee, and State Government.

B. *Agricultural Research*

Research work at headquarters.—Insecticidal trials against crop pests were conducted. Trials with zinc phosphide against rats were completed.

Combined sugarcane pest scheme Walchandnagar.—The results indicated that there was no significant decrease of borer population in plots where *Trichogramma* was released as compared to the control where parasites were not liberated. Co. 421 variety of cane was the least susceptible to the stem borer attack. The sugarcane pests under study were not observed on any alternate host plants.

Kane pest scheme Kumta.—Insecticidal trials against 'Kane' pest were continued.

Insect pest of paddy Karjat.—Preliminary trials with DDT emulsion, and meteldelyde as poison bait against crabs were taken. Insecticidal trials against other insect pests of paddy were continued.

Safflower pest scheme (I. C. A. R.).—Economics of the insecticidal trials against aphids were worked out.

Store pest investigation scheme, Bombay.—Gas proof covers were found quite suitable for fumigation of grain bags. ED/CT was found a suitable fumigant which could be used even by non-trained staff. From economic point of view methyl bromide was found to be cheaper. Magnesium oxide was found a good inert dust to keep off the insect pests in the grains.

Insect pest section, Padegaon.—It was noticed that heavy manuring and irrigation for sweet potato crop is beneficial to get more yields and to check the sweet potato weevils infestation in the crop.

5 per cent BHC dusting was found effective to check the attack of Bihar hairy caterpillars.

DDT and BHC scheme.—(1) 10 per cent BHC dust is found very effective in the control of Deccan wingless grasshoppers. One to two dustings are required to give complete control. The cost of dusting per acre may come to about Rs. 8 per application.

(2) The newer insecticides like DDT or BHC against aphids are neither efficacious nor economic. However, spray suspensions of Pyrocolloid (1:1000) and Nicotine sulphate (1:800) have given very satisfactory results. The cost of spraying per acre amounts to Rs. 10 and Rs. 11-6-0 per application respectievly.

(3) 5 per cent DDT-sulphur (1:1) against mangohoppers is found very effective and appears to be the most economic formulation.

G. A. PATEL,

Agricultural Entomologist to Government,
Bombay State, Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

Investigations and advisory work on the control of crop pests will be continued

(1) Work will be undertaken to test the various insecticides under laboratory conditions.

(2) Investigations on the thrip and jassids fauna of Poona.

(3) Bionomics and life history studies of (a) pumpkin beetles, and (b) fruit-flies will be undertaken.

(4) Insecticidal trials to find out a suitable insecticide tc control Katra hairy caterpillars.

(5) Bionomics and control of other sugarcane pests with insecticidal and mechanical methods will be investigated at Walchandnagar.

(6) Further trials on the control of stored grain pests.

(7) Insecticidal methods for paddy pest control will be investigated at Karjat and Kumta.

(8) Control of termites and fig-hoppers will be undertaken.

(9) New items like house fly control in compost and Chlorodane tests against grasshoppers will be undertaken under the DDT and BHC scheme at Poona.

G. A. PATEL,
Agricultural Entomologist to Government,
Bombay State, Poona.

APPENDIX VIII

Summary of the work done under the Professor of Agronomy, College of Agriculture, Poona, for the year 1949-50

A. *Staff and Administration*

Professor R. M. Chaudhari was holding the post of Professor of Agronomy up to the 12th February, 1950, and on his retirement, Principal, L. S. S. Kumar was holding charge of the post of Professor of Agronomy. Dr. B. A. Chaugule was appointed as Assistant Professor of Agronomy from the 1st September, 1949, on his return from America.

B. *Teaching*

Teaching in the subject of Agronomy was carried on as usual. The results of the Poona University in this subject are good. There is one Short Course conducted by this Section, for the period of one year in the practical crop-production. During the year under report, there was one student who attended the crop production course.

C. *The Agriculture College Farm*

The existing area under cultivation about 140 acres was found to be insufficient for teaching purpose and hence an area

of about 30 acres was brought under cultivation by levelling and bunding. Now the total area under cultivation under the Professor of Agronomy is 175 acres.

Season.—This year the rainfall started late and regular sowing started on July 17, 1950, after the sufficient rains in the early part of July. The rainfall was well distributed in the *kharif* season for the germination and further growth of all the *kharif* crops.

During the *rabi* season after the rainfall of 1.45 inches in the month of October, there was no rain in the whole rabi season. This handicapped the growth of *rabi* crops. This situation became wrost after the frost on February 11th, 1950, when the temperature had dropped down to 35°F, the crops severely affected were brinjal, sweet-potato, pototoes and cotton.

On the whole, the *rabi* season was not so favourable as it was in *kharif*. The total rainfall during the year was 18 inches, 60 cents which is below normal and number of rainy days during the year under report is 69.

Average yields of the important crops are given below:—

Name of crop	*yield in lb per acre.*
(1) *kharif* jowar	660 grain. 4,664 fodder dry.
Rabi jowar	968 grain 2,508 fodder dry.
(2) Nilva for fodder ...	4,196 fodder dry.
(6) Sugarcane	558 grain. 1,000 sarmad.
(4) Wheat ...	648 grain.
(5) Brinjal ...	5,200 fruit.
(3) Bajari	10,492 gur. 667 Molasis.
(7) Tobacco ...	572
(8) Cotton ...	90
(9) Suran ...	38,280
(10) Pumpkin ...	32,392

D. *Agricultural Research*

(*i*) Deep tillage Vs. shallow tillage in combination with and without manure was continued with Jarilla cotton and Nilva jowar for grains. In case of Nilva jowar, plowing and manuring was not significantly different from harrowing and manuring. Plowing and manuring is significant over harrowing and

plowing only. Harrowing and manuring is significantly superior to harrowing only, but is same as plowing. Similarly, harrowing and plowing are not significantly different. In case of Jarilla cotton, harrowed and manured treatment is significantly superior over harrowed, plowed and manured. Again, harrowed and plowed and manured are significantly superior to plowed only. But harrowed and plowed and manured are of the same order.

(*ii*) *Study regarding the effect of legumes and oil seeds.*—The experiment was continued as the previous years with bajri in rotation with soyabean, seasamum, groundnut and tur as mixture.

Bajri after soyabean is significantly superior to bajri tur mixture, bajri after sesamum and bajri after bajri.

Bajri tur mixture is significantly superior to bajri after sesamum and bajri after bajri.

Bajri after sesamum and bajri after bajri are not significantly different.

In the second part no significant different was found between bajri after groundnut and bajri after bajri.

(*iii*) *Varietial trials.*—These experiments were conducted with groundnut varieties and tobacco varieties.

In case of groundnut, Small Japan is significantly superior to K1 and Pondicherry, but was of the same order as K3 and Spanish peanut. Spanish peanut is not significantly superior to K1 and K3, but is significantly superior to Pondicherry.

In case of tobacco K49 was significantly superior to Nipani 20.2.

(iv) The sowing and spacing experiment on jowar was discontinued.

(v) Shri Kulkarni's experiment gave the results in confirmation with previous year, i.e., local method of cultivation of *rabi* jowar is superior to Kulkarni's method, i.e., dibbling on the sides of ridges open and then kept apart.

In addition to the above, the following new experiments were started this year:—

(1) Effect of different sources of nitrogen such as groundnut cake and cocoabean powder when applied as topdressing to *rabi*, jowar, was studied.

There were three treatments as given below:—

(*i*) Groundnut cake at the rate of 427.75 lbs. per acre

(*ii*) Cocoabean powder at the rate of 760 lbs. per acre.

(*iii*) *Control.*—The treatments were not significantly different from one another.

(2) To study the effect of leguminous crop (Chavali) to-dressed with phospharic manure on irrigated rabi jowar an experiment with four levels of P_2O_5 per acre was laid out.

The treatments were as follows:—

(1) Legume without any topdressing of superphosphate.

(2) Legume with 50 lbs. P_2O_5 per acre.

(3) Legume with 100 lbs. P_2O_5 per acre.

(4) Legume with 150 lbs. P_2O_5 per acre.

(5) No legume and base fallow.

The results indicate that the application of superphosphate to legume helps in increasing the yield of *rabi* jowar. The treatment without legume and without superphosphate was significantly better and that the treatment with legume but without superphosphate. The results are interesting and therefore, need further investigation.

The hybrid maize, the seeds of which were imported from U. S. A., were compared with local variety and significant difference was not noticed.

Work on the botanical improvement of Indian vegetables is being done under the Professor of Agronomy, Agricultural College Farm, Poona. During the year under report, i.e., 1949-50, various strains of the following vegetables were compared to investigate the inherent differences in yield, bearing capacity and other economic characters.

Various strains of vegetables were grown in statistical layout and the characters of the fruits were determined by actual measurements of length, breadth, weight, number of fruits, total yield etc. The results of the trials are as follows:—

(*i*) *Tomato.*—Strains (*i*) 3 P. B., (*ii*) 1/3s., (*iii*) 12/3s and (*iv*) 43.4 were found to be on par as far as their yielding capacities and were found to be significantly superior to all, the other strains in this respect.

(2) *Padwal.*—The total yield-part of the trial was vitiated on account of the damage caused by rats and fruit-flies. However, the comparision of characters of fruits indicate that

strain 30.2.2 has significantly longer fruits as compared to all the others. Similarly, strain 12.6.5.2 was found to be significantly thicker over all other, while (2) 20.5.5 and (ii) 29.1.4 were found to be the second best in this respect.

(3) *French bean.*—(*i*) 31, (*ii*) 34A, and (*iii*) Local showed a significantly high yielding capacities over the other strains tried.

(4) *Brinjal.*—The differences in the yield of various strains of Brinjal were found to be insignificant. However, comparison of fruits of various strains showed that (*i*) 4.4.6.9 and (*ii*) 13.4 (6) 21.5 were significantly superior in individual fruit weight, while (*i*) 28/1s 6.29 (*ii*) 39.7.4 (*iii*) 60-15-13 were linked and highest bearers.

The results of gowar and lettuce trials were statistically insignificant.

E. *Seed multiplication*

The Agricultural College Farm has multiplied the improved seeds of wheat, rust resistant wheat, *rabi* jowar, groundnut and vegetables for distribution through the Dy. Director of Agriculture, Crop Research and to the local cultivators through the District Agricultural Officer, Poona.

F. *Help to other Sections*

(1) The Central vegetable and fruit stall was continued during the year under report to facilitate the disposal of vegetables and fruits grown by the various sections on the College estate and also grown by the Manjri Farm.

(2) Help was given in the cultivation, etc. to all the Sections on the College estate and also to outside bungalow owners. The cultivation of the areas of Government bungalows situated in the Queen's park and the Infectious Diseases' Hospital compound continued during the year under report.

(3) A number of visitors from various institutions, Colleges and municipal schools from Poona and outside places have been shown round the Agricultural College Farm.

H. R. ARKERI,
Professor of Agronomy, College of Agriculture, Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) *Teaching.*—B.Sc. (Agri.) in Agronomy—Farm Management and Field Experimental technique.

S.Sc. (Agri.) Soil Management, Irrigated and Dry crops.

F.Sc. (Agri.) Implements and crops.

(2) *Cultivation.*—All the important crops of Bombay State will be grown as per previous year for teaching purposes and Hot weather Scheme of Vegetables is undertaken.

(3) *Research.—List of Experiments*:

(1) Tillage manure.

(2) Rotational experiment (Central legume).

(3) Varietial trial of Groundnut.

(4) Varietial trial of tobacco.

(5) Spacing and size of bulbs in onion crop for seed.

(6) Feeler experiment on wheat crop with different doses of N. P. K.

(7) Liquer ammonia experiment on maize.

(8) Silage Experiment.

(4) *Botanical Improvement of Indian Vegetables*

(1) Replicated yield trial in Gowar, 2 years.

(2) Selection work in cucumber.

(3) Attempts to produce parthennocrapic fruit in cucurbits and brinjal.

(4) Selection work in Bhendi.

(5) Multiplication of improved strains of vegetables in Bombay State.

(5) *Seed Multiplication.*—Gram, wheat (R. R.), Jowar (M-35-1), Groundnut.

(6) *Help to other Sections.*—As usual.

(7) Cultivation of Infectious Diseases' Hospital area and Queen's Park Bungalow compound area.

(8) *Running Central Vegetable Stall.*

(9) *Shows and Demonstrations.*—As usual.

(10) *Visitors.*—As usual.

H. R. ARKERI,
Professor of Agronomy, College of Agriculture, Poona.

Appendix IX

Summary of the work done under the Professor of Agricultural Economics, College of Agriculture Poona, for the year 1949-50

A. *Staff and Administration*

Gazetted staff.—Shri P. N. Driver, worked throughout the year as Professor of Agricultural Economics except between the 30th, September 1949, and the 29th November, 1949 when he was on leave. He was appointed Senior Examiner and paper-setter for the B. Com. (Nagpur); B. Sc. (Agri.) (Poona); B.E. (Civil) and B.E. (Mechanical and Electrical) examinations and also Senior Supervisor.

B. *Teaching and Research Work*

Apart from the actual teaching work in different places amounting to nearly ten lectures per week for the Professor alone and about 20 lectures for the staff put together, there was considerable research work in spite of there being not even one full-time Investigator. Shri Patel, Lecturer and Shri Diskalkar, Demonstrator, were of great help in this research work.

(*a*) *Village re-survey work.*—The detailed data on proprietory holdings and the changes in them to-day compared to the position more than 30 years ago in village Pimpla Soudagar was carefully complied. The work of classification of these holdings under different groups showing the average area, number of plots in each group, and the size of average plots was completed. An examination of the position of cultivated holdings has also been taken in hand and will be completed as early as possible. There is no special scheme or staff exclusively devoted to this work and its progress cannot be very rapid.

(*b*) *Land Tenure Reconstruction.*—Professor Driver completed and published his original thesis on the above. Experts like Dr. Gyan Chand, Sir J. A. Madan, Sir B. Rama Rao, Shri A. N. Jha, Tarlok Singh, Honourable Pandit Pant and others have spoken highly about this work. The Economic Advisor to the Honourable Prime Minister and Cabinet Secretariat, Government of India, has express to Professor Driver the hope that "when planning is undertaken in right earnest, our reconstruction will proceed on the lines suggested by you."

(c) *Crop Costing.*—Efforts were made to collect costing data, as required by the Government of India, from the Agricultural Schools and Experimental stations. The data was forwarded by the end of the year.

(d) *Village Rehabilitation Scheme, Amroli, Baroda.*—The Professor was put in technical charge of the above scheme sanctioned by the Indian Council of Agricultural Research. The object of the scheme is twofold (a) to rehabilitate cultivators of the Baniparaj tribe and (b) to determine the relative merits of different land tenures such as present proprietorship, tenant farming, and co-operative and collective farming. The villages under the scheme were visited by Professor Driver and a comprehensive Report on the working of the scheme during the last few years was issued by him.

(e) *New Scientific Costing Scheme and another scheme for tabulation of data on Agricultural Demonstration Centres.*—This Section was asked by Government to prepare a scientific costing scheme. A detailed scheme, involving scientific costing of at least four principal foodcrops grown on more than a hundred holdings selected from twelve different districts was accordingly submitted about December, 1949. Side by side with the above, a second scheme on costing to check and tabulate costing data as maintained by the Agricultural Demonstration Centres has also been formulated and forwarded to Government.

(f) *Scheme on costing of vegetable crops.*—A final decision on this scheme still remains pending as the Government of India is being consulted.

(g) *Preparation of data for determining Homogeneous Tracts in the Bombay State, including the merged areas.* A grouping of the different regions of this State on lines of clear cut conception of economic homogeneity, as distinguished from homogeneity based mechanically only on lines of soil quality, is essential. The recent merger of the Indian State also necessitates a revision of our past ideas and an up-to-date regrouping of all the regions in Bombay State is called for. Attempts were made this year only as a preliminary to crop costing schemes submitted to Government, to obtain reliable data in this direction. This work however is not easy and requires prolonged efforts and at least some extra staff about which there is no certainty. The work done so far is only in a formative stage.

(h) *Technical advisory research on economic questions.*—This is a very silent but important part of the work of this Section

and it continued throughout the year. Special mention may be made of important queries such as Crop Insurance, Rural Wages and Labour, Holidays with pay for Agricultural Workers, and many others of a like nature. The technical opinion of this Section as supported by the Director of Agriculture on several matters has been well received and accepted by others. Our opinion on Crop Insurance, for example, was accepted and strongly supported by the Settlement Commissioner and Director of Land Records and also by the Collectors of several districts.

C. *Post graduate course*

More than two dozen students applied this year to be taken up for post-graduate studies. Arrangements have been made this year to take up several research students.

D. *Miscellaneous*

(*a*) Professor Driver was appointed by the University of Poona as its delegate to the All India conference of the Society of Agricultural Economics at Madras in January 1950. He attended this conference also as one of the delegates of the Government of Bombay.

(*b*) Professor Driver continued to work throughout the year as a member of the Editorial Board of the Bombay Co-operative Quarterly.

(*c*) The Professor continued as an honorary teacher at the Co-operative Training College, Poona. Besides, he had to deliver a few lectures also at the College of Engineering.

(*d*) The Section participated in general work undertaken by the Department in the interests of the public. Several charts bearing on economic matters, including village re-survey were exhibited in the Poona District Agricultural show at Jejuri in February, 1950, and Shri Diskalkar was specially sent for explaining economic details to the cultivators attending the show.

(*e*) The annual class for training Deputy and Assistant Collectors was held in September, 1949, and Professor Driver delivered lectures and had discussions on land revenue and land tenure problems with the officers concerned.

P. N. DRIVER,
Professor of Agricultural Economics,
College of Agriculture, Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Examination of the present position of Agricultural Demonstration Centres after their reorganisation and the actual collection and tabulation of costing data maintained by the reorganised centres under the new scheme.

(2) Continuance of village re-survey work at Pimple Soudagar.

(3) Continuance of efforts to arrive at a workable idea of homogeneity of tracts in Bombay State.

(4) Research on village communities in Goa, commercial crops at Nipani and other problems done through post-graduate students.

(5) Actual working of the two costing schemes in case any one or both schemes are sanctioned.

(6) Detailed examination of the data sent by Experimental Stations and Government Farms for Government of India in year 1949-50. The object of this detailed examinations is to rectify defects in the costing farms of the Government of India and also to show why and where costing data of such farms as these is technically objectionable.

P. N. DRIVER,
Professor of Agricultural Economics
College of Agriculture, Poona.

APPENDIX X

Summary of the work done under the Professor of Agricultural Engineering, Physics and Mathematics, College of Agriculture, Poona, for the year 1949-50

A. *Staff and Administration*

Shri A. A. Vasawada was in charge of the Section throughout the year under report.

B. *Agricultural Education*

This Section imparts training to the college students in the subjects of Agricultural Engineering, Physics and Mathematics, including laboratory and field work. The students did well in the University Examinations. Over 93 per cent students passed in the subject of Physics and Mathematics at the F.Sc. (Agri.)

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examination and 98 per cent students passed in the subject of Agricultural Engineering at the B.Sc. (Agri.) examination.

C. *Administration of the College Estate*

During the vacation, a contour survey of the college area was carried out. This was with a view to have a complete composite map of the College estate and the soils therein. The soil survey was carried out by the Agricultural Chemist to Government, Bombay State, Poona.

The administration of the College estate and the operation and maintenance of gas-plant have been entrusted by the Principal to this Section. This has been carried out satisfactorily during the year under report.

D. *Miscellaneous*

The undersigned was the editor of the Poona Agricultural College Magazine of which 4 issues were published during the year under report. The management of the 16 m.m. cine-Projector has also been entrusted to this section and during the year under report, 19 shows were arranged for the benefit of the students and the staff-members of the college.

The duties of the Chairman of the College Gymkhana have been entrusted to the Professor of Agricultural Engineering, Physics and Mathematics from June onwards.

A. A. VASAVADA,
Professor of Agricultural Engineering, Physics and Mathematics, College of Agriculture, Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Teaching work at College.
(2) Administration of the Estate and gas plant.
(3) Management of educational cine-shows for students.
(4) Editorship of the Poona Agricultural College Magazine.
(5) Administration of the College Gymkhana activities as its Chairman.

A. A. VASAVADA,
Professor of Agricultural Engineering Physics and Mathematics, College, of Agriculture, Poona.

Appendix XI

Summary of the work done under the Deputy Director of Agriculture, (Crop Research), Bombay State, Poona, for the year 1949-50

A. *Staff and Administration*

During the year under report Shri V. M. Chavan continued to be the Deputy Director of Agriculture (Crop Research), Bombay State, Poona. He was on leave for one month and nine days from the 10th February 1950, to the 19th March 1950.

Shri V. K. Patankar, Officer Incharge Nuclus Seed Scheme, Poona, proceeded on leave preparatory to retirement with effect from the 28th October, 1949. He was re-employed from the 20th March, 1950, in his original post.

Shri P. S. Pandya, Plant Breeder and Officer, Incharge Cereal Breeding Station, Niphad, proceeded on transfer to Jalgaon as Cotton Breeder, Jalgaon, on the 15th January, 1950. Shri G. T. Babriwalla took over charge of the post of Plant Breeder and Officer, Incharge Rice Breeding Station, Mugad, with effect from the 11th July, 1949.

A new scheme for research on tuber crops commenced work at the Cereal Breeding Station, Niphad, from the 1949-50 *rabi* season.

B. *Agricultural Research*

(*a*) *Rice.*—(*i*) *North Konkan and Deccan—Karjat and Panvel (Kolaba), Vadgaon (Poona), Igatpuri (Nasik), Padegaon (Satara) and Nawapur (West Khandesh) Stations.*—At Karjat, the following new selections are ready for district trials in the Thana and Kolaba Districts.

Garvel 1-8	...	Late, Coarse, White for Thana.
Mahadi 8-2, 4-4	...	Early, Coarse, Red for Kolaba.
Ear Kolpi-70	...	Early, Fine, White for Nasik and Kolaba.

Promising synthetic cultures, viz. Late Zinya 14, Mid-late Zinya 3 and 48 and KZ cultures await further trials. The Crop Weather Observation Scheme was continued under the technical supervision of the Director of Agricultural Meteorology, Poona.

At Panvel, Kalarata Selection No. 1-24 and Bhurarata No. 4-10 have proved their superiority. Synthetic material between local salt land selections and standard sweet land

types was studied with the object of selecting economic combinations.

At Vadgaon, two Varangal selections seem to be promising. Early Kolpi 70 gave 22 per cent higher yield over local. At Nawapur and Jalgaon, preliminary selection in Kali kusal has been studied. On the basis of 3 years average, Krishnasal gave 13 per cent higher yield than Dodki under canal conditions at Kopargaon. Agromomic experiments conducted at some of the above farms gave the following indications:—

(1) Rabbing can be substituted by fertilisers.

(2) Eight seedlings planted 8″×8″ generally gave the highest yield.

(3) There is a good response to N in general.

(4) *Bobdi* weed can be controlled by weedicides.

(*ii*) *South Konkan.—Ratnagiri, Phondaghat, Chiplun (Ratnagiri) Kumta (Agricultural School) and Kagal (Salt Land) and Jagalbet (North Kanara), Stations.*—At Ratnagiri and Kumta, standard strains have been crossed with quality types to improve them.

At Kumta the following selections were found to be superior for the Karwar-Ankola zone:—

1.	Biliakka No. 303	... 15.46% over local.
2.	Doddapandya No. 396	... 12.55% over local.
3.	Sannamaliga No. 79	... 12.60% over local.
4.	Sanna Pandya No. 478	... 40.30% over local.

A secondary selection No. 11 from Jaddu 1061 has shown an increase of 10.77 per cent over the strain on an average of four years. Selection in preliminary stages in the zonal local varieties has been in progress at Phondaghat, Chiplun and Kagal.

A new sub-station was started at Jagalbet in the Supa Peta of the North Kanara district in order to improve the upghat rice varieties and to combat the pests and diseases of rice in that region.

Agronomic experiments gave the following indications:—

(1) There is a good response to N in general.

(2) Deglued bonemeal gave the lower yield than ordinary bonemeal.

(*iii*) *Karnatak.—Mugad (Dharwar) Station.*

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Synthetic material was studied with the object of isolating types, combining blast resistance and other economic characters.

Three agronomic experiments were conducted; the indications are:—

(1) There is a good response to N and seed rate to P_2O_5.

(2) A spacing of 15" between rows with 60 lbs. seed rate seems to give the highest yield in drilled paddy.

(3) Wal with P_2O_5 did not show any effect on the paddy crop.

(*iv*) *Gujarat.—Bulsar (Surat), Nawagam (Kaira) and Derol (Panchmahals) stations.*—At Bulsar, the following selections in the local varieties have been found to be significantly superior to local seed:—

White Kada No. 176-12.	White Kada No. 288.
Red Kada No. 10-3.	Wankvel No. 39-23.
Early Kolam No. 161.	

The last selection matures in 95 days and is suitable for growing in between lines of cotton in Gujarat.

At Nawagam, selections superior to local are available in Sukhwel, Sutarsal (Early), Jirasal and Pankhali varieties. At the new station Derol, selection in Sathi, Sariu, and Dudhani was continued in the early stages.

As a result of a spacing experiment, it was found that 10 or more seedlings spaced 6"×6" gave more yield.

(*b*) *Wheat.—*(*i*) *Deccan—Niphad (Nasik), Padegaon, (East Khandesh), Shahada (West Khandesh), Kopargaon and Puntamba (Ahmednagar), and Mohol (Sholapur) Stations.*—The rust resistant wheat cultures evolved at Niphad were under rapid multiplication both in the *kharif* and *rabi* seasons. Crosses were effected between standard types and rust resistant 'durum' wheat, 'Gaza' to evolve resistant strains better suited to dry conditions. Progenies in advanced generations of old crosses between standard types and rust resistant vulgare types from abroad are being tested for rust resistance and economic characters at Mahableshwar and Niphad, respectively. The Australian wheat S. S. Cilevana reputed for high yield was compared with the irrigated and dry wheats of Niphad, but it was found to be lower in yield.

At Shahada and Puntamba, the work was in the preliminary stages of selection.

The spacing cum sowing date experiment was continued at Niphad, Shahada, Mohol, Jalgaon and Kopargaon.

Crop Weather Observations on wheat crop were in progress at Niphad and Jalgaon.

(ii) Karnatak.—Bijapur, Dharwar, Annigeri, (Dharwar) and Bailhongal (Belgaum) Stations.—At Bijapur, four selections in local red hard wheat, which were promising from point of yield and other agronomic characters, were under trial; the best of them were crossed with 'Gaza'. Selection work at Annigeri and Bailhongal was in preliminary stages. F1s of crosses between local selections and 'Gaza' were grown.

(iii) Gujarat.—Arnej (Ahmedabad), Bhuwa (Broach) and Dohad (Panchmahals) stations.—At Arnej, Culture No. 206 of Dhola and No. 624 of Rata have been giving consistently better yields than the local by 10 to 15 per cent.

At Bhuwa, preliminary selection work was continued.

In a spacing experiment 12″ spacing with 40 lbs. seed rate per acre was found to be the best at Arnej.

(c) Jowar.— (i) Deccan—Padegaon (Satara), Jalgaon (East Khandesh), Karad (North Satara), Shahada (West Khandesh), Puntamba and Kopargaon (Ahmednagar) Stations—At Jalgaon, preliminary selection in the *kharif jowars,* viz. Aispuri, Satpani, Godgairya and Changdeo, and in the striga resistant material was continued. At Karad, selection in Argad and Gidgyap was in row trials. From the crosses, M-35-1 × Bonganhillo, F_5 and Argad × Bonganhillo F_3, made for introducing resistance to striga, promising selections have been made on a large scale. The following indications have been recorded from agronomic experiments:—

(1) There is a good response to N.

(2) Low seed rate with wider spacing is beneficial.

Crop Weather observations on *kharif jowar* continued at the Jalgaon farm. Shri B. D. Kulkarni's experiment was conducted at three places, viz., Kopargaon, Padegaon and Agricultural College Farm, Poona. The experiment was vitiated at Padegaon due to abnormal *rabi* rains, while at the other two places, local method gave higher yield.

(ii) Karnatak.—Mohol (Sholapur), Bijapur, Nipani and Bailhongal (Belgaum), Dharwar and Annigeri (Dharwar) Stations.—At Mohol, promising selections from Maldandi, Dagadi

and Bedri varieties were tried on a small scale along with the standard strains. Synthetic material in advanced generations of crosses effected specially for combining high yielding capacity with fodder quality, earliness and resistance to striga were studied and selections made.

At Bijapur, trials of Maldandi and Gund types were continued on a small scale. Promising cultures from crosses of M-35-1 and M-42-3 with fodder types have been obtained.

At Nipani, a selection in Gidgyap variety, viz., No. 89, has been found to be promising from two years trials. At Bailhongal, preliminary selection in American and *kharif* jowars, while at Annigeri in *kharif* and *rabi* jowars was continued. At Dharwar Farm, in the cotton, jowar (*kharif*) rotation with and without groundnut, jowar gave higher yield after the legume. Lower seed rate (4 lbs.) with wider spacing (18") gave better yield. In the N. P. Experiment, 40 to 60 N (GNC) and 20 to 40 P_2O_5 (Super) gave the highest yield.

At Bijapur, where experiments on *rabi* jowars were conducted, the following indications were recorded:—

(1) Town compost did not show any deleterious effect on gave much higher yield of jowar.

(2) Jowar after gram gave a higher yield than after wheat or jowar.

(3) P_2O_5 given to China mug, had a beneficial effect on *jowar* (*rabi.*)

Crop Weather Observations on *kharif* jowar were recorded at the Dharwar Farm.

(*iii*) *Gujarat.—Bhuwa* (*Broach*) *Stations*—Preliminary selection in local *rabi* jowars of Broach has been initiated at Bhuwa. In a trial of departmental *rabi* types, M. D. 15 and B. D. 8 did well.

(*d*) *Bajri.—Niphad* (*Nasik*), *Puntamba* (*Ahmednagar*), *Boriavi* (*Kaira*) *and Karad* (*North Satara*) *stations—Mass* selection was continued at Niphad in Deccan varieties. Crosses between inbreds were effected for further trials. Niphad 28-15 proved to be the best in a large scale trial with six locals and two Madras types; it was 30 per cent superior to Akola in yield. At Puntamba and Karad, preliminary selection in local bajri was continued.

At Niphad and Kopergaon, 60 lbs. N and P_2O_5 gave the best results.

(*e*) *Maize.—Arbhavi* (*Belgaum*) *and Dohad* (*Panchmahals*) *stations.*—Inbreds of various varieties were maintained both by selfing and mass pollination at Arbhavi. Two old and two new farm hybrids gave much higher yield over local both during *kharif* and *rabi* seasons.

Twenty exotic hybrids were compared with 7 farm hybrids; four exotics appear to be better in yield than the farm hybrids, however their grain quality was not good.

Eight groups of inbreds are maintained at Dohad. Twelve single combinations were superior to Sameri. Harland's method was continued at the third stage during the year. In a trial of exotic hybrids one viz. V. L. 5 gave slightly better yield in a row trial of 200 dibbles.

(*f*) *Small Millets.*—The important small millets were handled for improvement at the suitable stations.

(*i*) At Hatkhamba, early selections Nos. 28-1 and 50-1 gave on an average of three years' trials 16.6 and 20 per cent higher yield than the old type B-11. At Igatpuri, No. 47 out yielded old departmental types by 27 per cent. At Borivai, five selections giving 23 to 28 per cent. higher yield over local have been obtained. In district trials No. 47-1 proved its superiority at 8 out of 12 places by 10 to 20 per cent.

Two years' experiment at Hatkhamba showed 40 lbs. N with 60 lbs. P_2O_5 gave the best results. In an experiment planned to reduce the fallow period of Nagli at Hatkhamba and Igatpuri, it was noted that directly manuring nagli in the second year with either G. N. C. or F. Y. M. gave higher yield than the residual effect of manuring the crop at the same rate as in the previous year.

(*ii*) *Kodra* (*Paspalum scrobiculatum*).—At Hatkhamba, two Kodra and one Kodri (small grained) selections gave on an average of 3 years 13 to 15 per cent higher yield than local. Out of the three best selections tried at 9 places in the Kaira district selection No. 80-2 has given the best performance.

(*iii*) *Vari* (Panicum miliaceum).—The late vari selection No. 13-11 gave 21 per cent higher yield in three years' trials at Hatkhamba; while at Igatpuri, No. 4, 10 and 12 gave 10 to 47 per cent increased yield over local.

(*iv*) Two rala selections Nos. 30-1 and 31-1 out yielded the local check by 16 per cent on an average of 4 years at Niphad.

(*g*) *Pulses.*—Botanicial improvement of ten pulses has been in progress at suitable centres throughout the State.

(*i*) *Gram* (Cicer arietinum)—Selection in Synthetic cultures for big grain size was continued at Niphad. A seed rate of 30 lbs. per acre was found to be the best for the third time. At Shahada, Puntamba and Karad, preliminary selection in local gram varieties was continued.

At Annigeri, work on preliminary selections and yield comparison of promising ordinary and synthetic cultures was in progress. In yield trials of selections from Bijapur, Karad and Bailhongal, Chafa was found to be the highest yielder. Five with resistant, high yielding cultures from Bailhongal were tried at Nipani, Mohol and Annigeri along with Chafa and local as checks; the selections were superior to locals in yield, but not to chafa.

(*ii*) Tur (Cajanus Cajan)—At Arbhavi 10 selections combine high yield with wilt resistance. At Bhuwa, S. T. 15-15 from Boriavi gave the highest yield. At Annigeri and Mohol, selection in local tur varieties was continued in preliminary stages. At Kopergaon, from several years trials Kawnpore 132 and Khandesh 136-6 from Niphad proved their superiority over T 84 and local by 10 and 6 per cent, respectively. At Boriavi No. 15-15 has been consistently superior throughout.

(*iii*) *Mug* (Phaseolus aureus).—The crop suffered badly in Khandesh due to heavy rains and at Annigeri due virus disease; all trials got vitiated.

(*iv*) *Udid* (Phaseolus mungo).—Udid met with the same fate as mug at the Jalgaon Farm and in East Khandesh where 5 selections were tried. At Shahada, selection was continued in the preliminary stages.

(*v*) *Matki* (Phaseolus aconitifolius).—Preliminary selection in Satara varieties was continued at Karad. From the old Poona material, Ahmednagar 1-4, Nasik, 2-3 and Yawal 12-3 have been found to be promising in a replicated plot trial. Nadiad and Dhari did well at Boriavi while Jagudan and Yawal at Mohol.

(*vi*) *Kulthi* (Dolichos biflorus).—Preliminary selection in local kulthi varieties was continued at Bailhongal and Shahada. Six selections from the old Dharwar material seem to be promising. In a large scale trial of 9 selections at the Dharwar Farm, Hyderabad A-3-2 and Ramdurg 1-2 were found to be superior.

(*vii*) *Wal* (Dolichos lablab).—At Bulsar, No. 125 gave consistently higher yield by about 15 per cent.

(*viii*) *Lang* (*Lathyrus sativus*).—At Bhuwa, a replicated plotscale trial in wilt free soil with the three land types, viz. T 2-1, T 2-12 and Poona 3-1, along with Broach local, showed that the local was significantly superior in yield. Amongst the types, T2-1, was significantly superior to the others.

(*h*) *Oilseeds.*—(*i*) *Groundnut* (Archis hypogeea).—Yield trials of promising selections possessing high yield, oil content and kernel per centage were further continued on a large scale at Jalgaon to judge the best ones.

It has been conclusively proved at Kopargaon that Spanish improved type is superior to local by 10 per cent.

Section work in local varieties was carried out in the preliminary stages at Dohad, Shahada, Karad, Mohol and Bailhongal.

(*ii*) *Sesamum* (Sesamum indicum).—Selection in local sesamum varieties was continued at Boriavi, Niphad, Shahada and Puntamba at the rod row stage. At the Kopargaon, Farm, Niphad 85 proved its superiority over A, B and local in four years' trials giving 13-5 per cent enhanced yield.

(*iii*) *Safflower* (*Carthamus Tinctorius*)—Three new promising cultures were compared with N 630; all gave higher yield and oil content over the check at Niphad. At Karad, Annigeri and Bailhongal, preliminary selections were under study in progeny rows. At Annigeri, selection No. L. S. S. S. 300 gave the highest yield during its first trial.

(*iv*) *Niger* (*Guizotia abyssinica*)—Selection work in niger was continued at Puntamba and Niphad at the preliminary stage. At the Dharwar Farm old selection A and B proved to be superior to local by 100 lbs. more per acre in four years' trials; type 'B' being superior to 'A' similarly type 'B' proved its superiority at Bijapur and Kopargaon.

(*v*) *Linseed* (Linum usitatissimum).—At Niphad, synthetic selection in early generations were under study for economic characters. 15 lbs. of pure nuclear seed and 1,600 lbs. of second stage seed of M—10 was multiplied as a bisis for the Nasik Seed Multiplication Scheme.

(*vi*) *Castor* (Ricinus communis).—The old types S-20 and 85 were maintained pure and multiplied at Boriavi for distribution.

(*i*) *Other crops.*—(1) *chilli* (Capsicum fruteseeus)—Chilli breeding work has been recently shifted to the Agricultural School, Devihosur, from Hirekerur. One of the old

selections, viz. 80-1, has shown consistently better performance than the local in yield.

At Nipani, 3 Sankeshwari selections, viz. Nos. 22, 20a and 32, were significantly superior to the local. Again in a trial between C_2, C_9 S_{22} S_{52} and local, the first three were found to be significantly superior to the local.

From agronomic experiments, the following indications have been recorded:—

(1) N. 30:P. 15: K 15 gave the highest yield.

(2) A spacing on 2 feet with 3 seedlings per hill gave the best results.

(2) Tuber crops—(*i*) *Sweet potato* (Inomoea Batatas) Trials of various local and exotic varieties were continued at Niphad. From amongst the 14 varieties from Dr. Boshi Sen Nos. 7-13-4001 and 6-B-219 were found to be promising. The local superior types, viz. C. L. 44 and B-2, are undergoing district trials.

(*ii*) *Onion* (*Allium capa*)—Selection in red and white onion varieties was continued at Niphad. Several types, including male storile and disease resistant ones received from California, were also planted for seed, but many of them rotted.

(*iii*) Potato (*Solanum tuberosum*)—A trial of 8 new Simla hybrids with '*Numbri*' as check was conducted; none of them was superior to '*Numbri*' at Vadgaon. Culture No. 356 was consistently superior to '*Numbri*'.

A comprehensive experiment comprising manurial treatments of N. P. and K. and watering interval of 7 and 9 days during the period starting from one month after planting was conducted. The indications from the experiment were that 7 days interval gives much higher yield than 9 days' interval, a dose of higher than 40 lbs. N. does not appear useful, the crop responds to P_2O_5 and K only in the 7 days interval.

A trial of 3 manure mixtures was carried out on 10 cultivators' field in the Khed taluka. The mixture 70-N (G. N. C. + A. S.): 70 P_2O_5 (Super+B. M.) gave significantly higher yields than the other two, viz., 70 N (G.N.C.+A. S.); 70 P_2O_5 (Super) and 50 N (G. N. C.+A. S.): P_2O_5 (Super): 50 K (S. P.).

C. *Officers' day and Farmers' Week*

Demonstrations and Agricultural Exhibitions.—Officers day and Farmers' Week demonstrations were held at the Rice

Breeding Stations, Panvel and Karjat in the Kolaba district during the year under report. Agricultural shows and exhibitions were held at the 16 places in different districts.

D. *Nuclear Seed Supply*

The following quantities of pure nuclear seed of improved strains was multiplied and supplied by the various farms:—

Name of the Strains.		Quantity. lb.
Paddy (Transplanted)	...	40,000
(Drilled)		31,920
Millets (Jowar)	...	103,000
(Bajri)	...	24,000
(Maize)	...	12,800
Wheat	...	182,400
Nagli	...	4,000
Other crop (Gram)	...	75,800
(Groundnut)		83,000

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PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) *Rice*—

(*i*) Maintenance and study of Indian and exotic types.

(*ii*) Selection in principal local varieties and trials of departmental types on new farms.

(*iii*) Hybridisation and selection in synthetic material to improve grain quality and to introduce Blast, resistance in fine rices and resistance to saline conditions.

(*iv*) District trials of selections of proved merits in farm trials.

(*v*) Agronomic experiments at suitable farms:—

(*a*) Spacing cum seedlings per bunch.
(*b*) N. P. requirements with and without F. Y. M.
(*c*) Phosphate applied to legumes to see effect on succeeding rice.
(*d*) Rab substitutes.
(*e*) Spacing cum seed rate in drilled rice.
(*f*) Degdued vs. ordinary Bone meal.
(*g*) Application of Dolomite.

(*vi*) Nuclear seed multiplication of standard strains.

(*vii*) Crop Weather Observations at Karjat in collaboration with the Director of Agricultural Meteorology.

(2) *Wheat*—

(*i*) Items (i) and (ii) as under Rice above.
and

(*ii*)

(*iii*) With special reference to rust resistance.

(*iv*) As under Rice above.

(*v*) Agronomic experiments on suitable farms:—

(*a*) A spacing cum sowing date experiment.
(*b*) Trial on N. P. wheats.
(*c*) Time and method of application of G. N. C. to dry wheat.
(*d*) Seed treatment against seedlings blight and solar treatment against loose smut at suitable centres.
(*e*) Phosphate to a legume, viz., gram, China mug, etc., to see effect on succeeding wheat crop.
(*f*) Spacing cum seed rate experiment from 24 to 56 lbs. per acre.
(*g*) Rotational experiment with gram and jowar.
(*h*) N. P. requirements of irrigated wheat.

(*vi*) Nuclear seed multiplication of standard types in *rabi* and of rust resistant types both in *kharif* and *rabi* seasons.

(*vii*) At Niphad and Dharwar as in the case of Rice.

(3) *Jowars* (Rabi.)

(*i*) Items (*i*) and (*ii*) as under Rice, above.
and

(*ii*)

(*iii*) With special reference to striga resistance and to improve fodder quality.

(*iv*) As under Rice, above.

(*v*) Agronomic experiments on suitable farms:—
(*a*) N. and P. requirements.
(*b*) A spacing cum seed rate experiment.
(*c*) Shri B. D. Kulkarni's experiment on *rabi* jowars (irrg)
(*d*) Weedicide on the Jowar parasite '*Striga*'.
(*e*) Rotational experiment on *rabi* jowar, after wheat and gram in *kharif* jowar with cotton and groundnut.
(*f*) Town compost and *rabi* jowar.

(*g*) Phosphate to legume (gram and China mug) to see the effect on succeeding jowar.

(*vi*) As in the case of rice above.

(*vii*) At the Jalgaon and Dharwar Farms in *kharif* jowars, as in the case of Rice, above.

(4) *Bajri*—

(*i*) Items (*i*) and (*ii*) as above.

and

(*ii*)

(*iii*) Hybridisation between inbreds to secure hybrid vigour, their trials and mass selection.

(*iv*) Trials in the Akila taluka and strains and their hybrids from Niphad.

(*v*) Agronomic experiments.

(*a*) N. P. requirements (dry and irrigated).

(*b*) Seed grading experiment.

(*c*) Rotational effect of tur on succeeding bajri.

(*vi*) As the case of in Rice, above; also production on hybrid seed.

(5) *Maize*—

(*i*) Items (i) to (iv) as under Bajri above and to trial of exotic hybrids; Herland's method.

(*iv*)

(*v*) Agronomic experiments.

(*a*) N. P. requirements.

(*b*) Effect of gram on succeeding maize crop.

(*vi*) As under bajri above.

(6) *Small millets*—

(*i*) Items (*i*), (*ii*) and (*iv*) as under Rice, above.

(*ii*) and

(*iv*)

(*v*) Agronomic experiments.

(*a*) N. P. requirements.

(*b*) To reduce fallow period in nagli.

(*vi*) As in the case of nagli, above.

(7) *Oilseeds*—

(*i*) Items (*i*) and (*ii*) as under Rice, above

and

(*ii*)

(*iii*) With special reference to oil content, shelling percentage etc.

(*iv*) Same as in other crops.

(*v*) Agronomic experiments.

(*a*) Phosphate on groundnut to see effect on succeeding cereals.

(*b*) Rotational experiments with cotton and cereals.

(*vi*) As in the case of rice, groundnut, linseed etc., above.

(8) *Pulses*—

(*i*) Items (*i*) and (*ii*) as under, Rice above.
and

(*ii*)

(*iii*) Item (*iii*) with special reference to wilt and virus resistance.

(*iv*) As in the case of Rice, above.

(*v*) Agronomic experiments.

(*a*) Seed rate experiment in gram.

(*b*) Phosphate on legumes to see effect on succeeding Cereals.

(*vi*) Seed multiplication of improved types of gram, lang and wal.

(9) *Chilli*—

(*i*) Items (*i*) and (*ii*) as under Rice, above.
and

(*ii*)

(*iii*) Item (*iii*) with special reference to vegetable types.

(*iv*) Agronomic experiments.

(*a*) N, P, K, requirements.

(*b*) Spacing cum number of seedlings per hill.

(10) *Tuber crops*—

(*i*) Items (*i*) and (*ii*) as in the case of other and crops, with special reference to the trials.

(*ii*) of local and exotic varieties, in sweet potato and onion and Simla hybrids in potato.

(*iii*) Jones' method to obtain superior masses and male sterile lines in commercial varieties.

(*iv*) District trials of Simla hybrid No. 356 and sweet potato selections B_2 CL_{44} and G. T. 6.

(*v*) Agronomic experiments.

(*a*) Manure mixture trials with three mixtures an cultivators' field.

(b) A spacing cum set size experiment on potato.
(c) N, P, K requirements with watering intervals experiment in potato.

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Appendix XII

Summary of the work done under the Statistician, Department of Agriculture, Bombay State, Poona, for the year 1949-50

A. *Staff and Administration*

Shri R. S. Koshal held charge of the post of Statistician, Department of Agriculture, Poona, throughout the year under report.

The work of this Section is classified under four main heads:—

(1) Crop-Cutting experiments.

(2) Design and Statistical analysis of field experiments.

(3) Collection and compilation of Agricultural statistics and issue of crop forecast, Season and Crop Report etc.

(4) Estimation of additional production due to 'Grow More Food' measures.

B. *Crop-Cutting experiments*

During the year 1949-50, crop-cutting experimental surveys on a State-wide scale on seven principal crops, viz., paddy, *bajri*, *kharif* jowar, wheat *rabi jowar*, cotton and tobacco, and those on a district scale on maize (in Panchmahals), ragi (in Ratnagiri), *kodra* (in Kaira), groundnut (in East Khandesh) and gram (in Kaira), were continued; separate experiments on irrigated paddy, bajri, *rabi jowar* and wheat in the major canal areas of the State were also continued. As the question of extending the experiments to the new districts formed by the merger of States was still under consideration of Government, the experiments were confined to the old Bombay State. The results obtained from these surveys are given below for the pre-merger Bombay State:—

Paddy.—The State average yield based on 1,632 plots distributed in 546 villages is estimated at 1176 lbs. or 784 lbs. of rice

with a sampling error of 1.6 per cent. The total estimated outturn of rice is 739 thousand tons as against the official estimate of 778 thousand tons which is an over estimate to the extent of 5 per cent.

Kharif Jowar.—The State average yield of *kharif jowar* basde on 1,280 plots distributed in 427 villages is estimated at 503 lbs. per acre with a sampling error of 3.3 per cent. The total estimated outturn of *kharif jowar* is 554 thousand tons as against the official estimate of 481 thousand tons which is an underestimate by 13 per cent.

Bajri.—The State average yield of *bajri* based on 1,816 plots distributed in 608 villages is estimated at 242 lbs. per acre with a sampling error of 2.6 per cent. The total estimated outturn of bajri is 420 thousand tons as against the official estimate of 464 thousand tons which is an overestimate by 10 per cent.

Cotton.—The average yield of kapas for the State estimated from 1,016 plots distributed in 366 villages is 216 lbs. per acre with a sampling error of 3.7 per cent. This year's average yield is rather low mainly due to damage caused to cotton crop in Khandesh districts by heavy rains in September. The estimated total production of lint is 310 thousand bales (of 392 lbs. each) as against the official estimate of 258 thousand bales, which is an underestimate by 17 per cent.

Wheat.—The estimated State average yield of wheat based on 1,422 plots distributed in 478 villages is estimated at 222 lbs. with a sampling error of 2.4 per cent. The total estimated outturn of wheat is 255 thousand tons while the corresponding official estimate is 275 thousand tons which is an overestimate by 8 per cent.

Rabi jowar.—The State average yield of *rabi jowar* based on 1422 plots distributed in 478 villages is estimated at 222 lbs. per acre with a sampling error of 4.4 per cent. This year's average yield is low mainly due to failure of crop in the South Deccan districts, as a result of deficiency of soil moisture. The total estimated outturn of *rabi jowar* is 658 thousand tons as against the official estimate of 732 thousand tons which is an overestimate to the extent of 74 thousand tons or by 11 per cent.

Tobacco.—The estimated average yield of tobacco for the State based on 343 plots distributed in 117 villages is 561 lbs.

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per acre with a sampling error of 4.6 per cent. The total estimated outturn of tobacco is 34 thousand tons as against the official estimate of 29 thousand tons which is an underestimate by over 14 per cent.

District crops.—The district average yields of maize, *rabi kodra*, groundnut and gram are estimated at 753, 485, 871, 424 and 214 lbs. per acre with sampling errors of 6.4, 4.3, 6.2, 5.4 and 5.5 per cent respectively.

Crop-cutting experiments in major canal areas.—The estimated average yields of irrigated paddy, *bajri*, wheat and *rabi* jowar in the major canal areas of Bombay State are 938, 244, 735 and 543 lbs. per acre respectively.

As proposed in last year's report, the results of the Crop-cutting experiments were utilised for the first time for framing the yield forecasts of various crops for major districts where these experiments are being conducted. For the remaining districts, the outturn was based on the annawari figures supplied by the Collectors.

C. *Design and Statistical analysis of field experiments*

Progress of the work for the year under report under this sub-section is given below:—

(i) Plans of the experiments in progress on the various Government Agricultural Farms were scrutinised from time to time for both *kharif* and *rabi* season and about 25 layouts were given to the Departmental officers, concerned.

(*ii*) Collation of results obtained from the experiments conducted at Government Agricultural Farms for a number of seasons was carried out. The chief conclusions drawn from some of these experiments are:—

(I) Spacing-cum-seedlings per bunch experiments on transplanted paddy. The lowest spacing at Bulsar, Kumta (6″×6″), Ratnagiri and Igatpuri (8″×8″) is superior to wider spacing; while at Vadgaon farm the existing spacing of the tract (9″×9″) is worth maintaining. At Karjat Farm wider spacing (12″×12″) appears to be an economic one.

At Bulsar, Kumta, Ratnagiri and Igatpuri Farm, 6 seedlings per bunch appear to be the minimum requirement, while at Karjat and Vadgaon Farms, 8 seedlings per bunch have shown better results.

(II) Spacing-cum-seedrate experiments on drilled paddy : 15″ spacing coupled with 60 lbs. seedrate per acre appears to be the optimum treatment for yield per acre.

(III) Manurial experiments involving graded doses of nitrogen in the form of groundnut cake on different crops conducted from 1944-45 to 1947-48.

Paddy.—At Kumta, there was a liner response to Nitrogen in the first three years of the experiment, but in 1947-48, there appeared to be an optimum at 64 lbs. N/acre.

From two years' trials at the Karjat Farm (1945-46 and 1946-47), there appears to be an optimum at about 112 lbs. N/acre; the economic optimum calculated from the results of 1947-48 was 86 lbs. N. per acre.

Wheat.—There appears to be an optimum in the neighbourhood of 60 lbs. nitrogen per acre at Niphad Farm.

(IV) Manurial experiments involving phospharic acid (bonemeal or bone superphosphate) as one of the treatments on different crops conducted from 1944-45 to 1947-48 : From the analysis of these experiments, the following tentative conclusions were drawn:—

P_2O_5 in the form of bonemeal.—There appears to be a good response of the yield of paddy to P_2O_5 at Kumta Farm. At Mugad Farm, 128 lbs. N coupled with 2 cwt. bonemeal has given the optimum yield in 1947-48.

Nagali.—The response to P_2O_5 was good (being 11 lbs./acre) in the year 1948-49 at Hatkhambha Farm, but when the experiment was repeated on the same site, it had come down to 6 lbs. per acre.

P_2O_5 in the form of bone superphosphate.—Bajri.—At Dhulia, Lakhamapur and Kopargaon Farms, P_2O_5 had shown an adverse effect on the yield of bajri in 1946 and 1947, while at Padegaon, the response of *bajri* to P_2O_5 was 3.4 lbs./acre.

Kharif jowar.—As in the case of *bajri*, P_2O_5 had an adverse effect on the yield of *kharif jowar* at Dhulia (1946) and Lakhamapur (1947) Farms, while at Dharwar Farm (1946), the response was only 1.5 lbs.

Rabi jowar.—As in the case of *bajri*, the response of *rabi jowar* to P_2O_5 was good at Padegaon Farm (1946 and 1947) and poor at Kopargaon Farm (1946).

Wheat.—Contrary to the results of *bajri* and *jowar*, wheat had shown a good response to P_2O_5 at Lakhamapur and Kopargaon Farms in 1947-48.

Statistical analysis for a number of experiments conducted during the year were carried out, the principal among those being (*i*) the experiment to study the effect of leguminous crop grown with and without phosphatic manure on the succeeding cereal crop; (*ii*) the experiment to study the N. P. K. requirements of chillies at Devihosur in the year 1949-50 and (*iii*) the experiment to find out suitable substitutes for rab for paddy conducted at Igatpuri and Karjat farms in 1949-50.

A paper 'Experiments on manuring of grass land at Palghar, Bombay State', was read in the Science Congress held at Poona.

D. *Collection and compilation of Agricultural Statistics*

In all 75 forecast reports, on various foodgrain crops, oil seeds, cotton, sugarcane, ginger, pepper and tobacco were prepared and published. A daily record of rainfall for about 220 stations in the State was maintained. Similarly, the rainfall tables showing daily rainfall during each month and monthly rainfall returns with notes giving character of the agricultural season and condition of crops during the respective months were prepared and published in the Bombay Government Gazette, Part III. The preparation of monthly and Annual Rainfall Table was undertaken and is in progress. Monthly returns of average retail prices, fortnightly returns of retail and wholesale prices, weekly cotton press returns and monthly ginning returns were complied and published in the Bombay Government Gazette, Part III. The Annual season and crop Report of the Bombay State for 1948-49 was under preparation. The information about stocks of cotton held by cotton traders and owners of factories on 31st August was collected. Information about estimates of crop acreages and yields of various foodcrops and acreages under cotton according to varieties, etc., was also collected and a large number of references relating to agricultural statistics received both from the Government of India and Government of Bombay, were attended to.

E. *Estimation of additional production due to 'Grow More Food' measures*

Large number of schemes for intensive cultivation are in progress in Bombay State which involve various 'Grow More Food' measures for increasing production of foodgrains. It is essential to make a correct estimation of the additional production due to these 'Grow More Food' measures.

The Indian Council of Agricultural Research constituted an Ad Hoc Committee for developing a technique to be followed for assessing additional production from 'Grow More Food' measures. The Committee met at Nagpur on the 16th, 17th and 18th September, 1949, and recommended that in order to obtain reliable estimates of additional production, it is essential (1) to know the actual acreage in respect of 'Grow More Food' aid and (2) to estimate rate of response through controlled experiments on cultivators' fields. A pilot scheme on the lines recommended by the Ad Hoc Committee was conducted in the State of Bombay in the districts of Poona and Sholapur for *rabi* jowar and Nasik for wheat in the *rabi* of 1949-50, to estimate the additional production of these two crops due to various 'Grow More Food' measures. In this scheme, the experiments to estimate the rate of response were carried out by the Agricultural Assistants working under the District Agricultural Officers, while the work of enumeration of area under 'Grow More Food' aid was carried out by the talatis of the Revenue Department. The field work was supervised by the special staff provided in the pilot scheme and other staff of the Statistical Section of the Department of Agriculture.

The additional production of *rabi jowar* due to the three measures of intensification, viz., improved seed manure and new irrigation, in four talukas of the Poona district and 8 talukas of the Sholapur district is estimated at 5,725 tons. This is a substantial increase in yield but it is less than 4 per cent of the total production of *rabi jowar* (150, 746) in these talukas in the two districts. The additional production of wheat in 9 talukas of Nasik district due to 'Grow More Food' measures is 1,100 tons, which is about 4 per cent of the total production of wheat (25,305 tons) in these talukas in the districts.

F. *General*

An important event in the history of this Section, which deserves special mention was the 'Third Annual Session of the Indian Society of Agricultural Statistics, which was held at the College of Agriculture, Poona, on the 30th and 31st December, 1949 and the 1st January 1950. The delegates were welcomed by Shri D. A. Gadkari, Joint Director of Agriculture. The session was inaugurated by Hon'ble Shri M. P. Patil, Minister for Agriculture and Forests, Government of Bombay. Statisticians and Research workers in the field of Agriculture Animal

Husbandry, from all over the Indian Union attended the conference in the large number and participated in the discussions. Two symposia were arranged at the meeting: one on 'Crop and Cattle Insurance' opened by Professor Priolkar and presided over by Shri M. G. Mehkri, Deputy Governor, Reserve Bank of India, and the other on 'Crops and Weather' opened by Dr. L. A. Ramdas and presided over by Shri S. Y. Krishanaswamy, Joint Secretary, Ministry of Agriculture, Government of India. A notable feature of the meeting was a popular lecture on 'Science in the Country side' by Professor C. V. Raman, which drew large audience. The lecture was presided over by Dr. M. R. Jayakar, Vice Chancellor, Poona University. Another very interesting popular lecture was on 'Numismatics as Science' by Professor D. D. Kosambi of the Tata Institute of Fundamental Research, Bombay. This lecture was presided over by Shri M. R. Yardi, Collector of Poona.

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PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) *Crop Cutting experiments.*—Crop cutting experiments on State-wide scale on seven principal crops and on five more crops in one district each would be continued. Likewise separate crop-cutting experiments on irrigated paddy, *bajri, rabi jowar* and wheat in the major canal areas of Bombay State will also be continued. It is proposed to extend the scope of crop cutting experiments to new districts formed by merger of States. It is also proposed to improve acreage statistics of principal crops, on which crop cutting experiments are being conducted, by rationalised methods of checking and supervision based on randum sampling.

(2) *Design and Statistical analysis of field experiments.*—(*i*) Plans of agromomic and manurial experiments recommended by the Special Agronomic Committee and conducted on the Government Agricultural Farms will be scrutinised. Layouts for new experiments undertaken by the Departmental Officers will be prepared and the results of the experiments conducted during the year would be analysed and collated.

(*ii*) Analysis and interpretation of results obtained from special experiments conducted from time to time will be taken during the year.

(*iii*) Collation of the agronomic and manurial experiments conducted over a number of years and preparation of Statistical Reports on the results collated.

(3) *Compilation of Agricultural Statistics and preparation of crop forecasts, season and crop reports.*—(*i*) Work on rainfall, prices, cotton ginning and pressing returns, preparation of usual forecasts will be continued.

(*ii*) To undertake forecasts on pulses, tobacco, potatoes, spices and such other crops as would be recommended by the Economic and Statistical Adviser, Government of India.

Mention has already been made of the utilisation of the results of the crop cutting experiments for framing the yield estimates shown in the forecasts. This will be done in the case of *all possible* crops and areas in future, where these experiments are conducted.

The Government of India desire that the Season and Crop Report should be a comprehensive compendium of Agricultural Statistics by including therein the area and yield of almost all the crops. The report will be prepared accordingly from the year 1950-51.

(4) *Estimation of additional production due to 'Grow More Food" measures.*—In the light of experience gained from the results of pilot scheme undertaken in *rabi* of 1949-50, and modification suggested by the committee for assessing results of Grow More Food measures, set by the Government of Bombay, the pilot scheme will be extended to all the districts of the State where Grow More Food measures are applied in large quantities.

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Appendix XIII

Summary of the Work done under the Cotton Botanist, Bombay State, Surat, for the year 1949-50

A. *Staff and Administration*

Shri G. B. Patel continued to be the Cotton Botanist, Bombay State, Surat, except during the period from the 1st December, 1949, to the 31st January, 1950, when he was on leave and Shri V. V. Patel, Cotton Superintendent, Surat, worked as Cotton Botanist, in addition to his own duties.

B. *Season*

The monsoon started rather late, i.e. in the early part of July in the Bombay State, except in Khandesh where it commenced in time, i.e., in the latter part of June. In North Gujarat, the rainfall was low (11 inches at Viramgam, and 12 inches at Jagudan and Vijapur), the late September rains being particularly deficient. The cotton yield in the broach tract was above normal due to the effect of partial fallow on account of poor season in 1948-49. On the other hand, in Khandesh, the yield of cotton was adversely affected due to heavy late rains in September-October. On the whole, the season for cotton and tobacco was satisfactory.

C. *Research Work*

(i) *Cotton Research.*—(1) Cotton breeding at Surat—Four promising types, viz., 77-2, 3652, 2334 and 2087, were tried in replicated tests at the Surat and Shere Farms and at seven representative places in the tract including the merged areas of the Baroda and Rajpipla States and the Nawapur taluka of West Khandesh district with Suyog and or 1027 A. L. F. as controls. Of these types, 3652 and 2087 are wilt resistant. Type 77-2 has the staple length of 1027 A. L. F. with ginning percentage nearly as high as that of Suyog combined with good yield and earliness. The type 3652 has even higher ginning percentage (by 1.5 per cent) than Suyog, but the staple is slightly shorter. It has, however, finer fibre, resulting in higher spinning value than Suyog (by 5 counts). The type 2087, which was included in the district trials for the first time, has proved to be particularly promising for yield, but it has slightly lower ginning percentage by about one per cent than Suyog. In staple length it is as good as 1027 A. L. F. The district trial results of these types are being further watched and the promising types are being multiplied to get sufficient lint

for mill tests as well as enough seed for further multiplication.

(2) Scheme for breeding wilt-resistant strains for Surat area at Shera—The wilt resistant strains 2266, 3652 and 2087 kept up their performance under heavily wilt-infected conditions at Shera. The strain 2087 gave higher yield than 3652 both in the breeding area and on the cultivator's field. Cross comparison of the material received from Poona for wilt-resistance and agricultural characters is also being done at Shera. Further research work at Surat and Shera is directed towards working up the material from crosses and backcrosses of the wilt resistant type 3652 with long staple types.

(3) Interspecific hybridization in cottons at Surat: Ten types derived from fertile backcrosses were further tried in replicated tests with Suyog and Co2 as controls. Seven of them approached Suyog in seed cotton yield. As compared to Co2, all, except 134-Co2-M, having extra long staple of 1.11″ as against 0.84″ of Co2, have shown better performance. In ginning percentage, they vary from 35 per cent to 39 per cent as against 36 per cent of Co2 and 39 per cent of Suyog. Some of the interspecific types were tried under irrigated conditions at Kopargaon and Padegaon (Deccan Canals) and at Dharwar, Gadag and Boriavi (Kaira district) under rainfed conditions and were found to be good in yield with high ginning percentage and long staple 1.05″ to 1.15″ as against 1.03″ of Co4, which is at present the best suited American variety for the Deccan Canals area. Additional material consists of Crosses and backcrosses with wild types of cotton, viz., Gtomentosum, G. armourianum and G. anomalum. Material involving G. tomentosum in backcrosses with Co2 and other interspecific types shows high degree of resistance to jassids and red leaf blight. Crosses with G. anomalum may give material resistant to blackarm disease.

With a view to producing extra long staple cotton and taking the advantage of hybrid vigour, some F1 combination were tried. Of these, Co2 × S.K was tried on field scale both under irrigated and dry conditions. The results showed that the hybrid crop did produce extra long, fine and silky fibre capable of spinning up to 60s to 80s H. S. W. C. This can be profitably grown only on a limited area under widely spaced garden conditions, as hybrid seed needs to be produced afresh every year requiring special organisation for the same and it is rather costly (about Rs. 20 for one acre).

Cytological investigations were carried out in crosses involving the local *herbaccum* types with the African wild species G. amonalum. It was found that all the first backcrosses individuals exhibited a certain degree of irregularity in pairing and segregation, resulting in partial sterility. In the case of second back cross plants, however, it was found that chromosome pairing and segregation were almost normal.

(4) Cotton breeding at Broach.—Wilt attack in ten promising families ranged from 0.7 per cent to 6.8 per cent as against 56 per cent in the susceptible type 1027 A. L. F. Bulk seed was tried in replicated tests in wilt-free soil with Vijay as control. The yield varied from 918 lbs. to 1,140 lbs. per acre, while ginning percentage was above 40 per cent in each case. Vijay had 1,045 lbs. yield per acre with 41.8 per cent ginning percentage. There are four promising cultures from family 66-60 and one from 98-41 with staple length of 0.94″ to 0.98″ as against 0.93″ of B. C. 1-2 (Vijay). Variety trials for testing 66-60-98-24 and 98-41 from Broach, 3652 from Shera and 2334 from Surat, with B. C. 1-2 (Vijay) as check, were conducted at the Broach Farm, Dabhoi Farm, Dudhathal in the Kaira district and Maghnad in the Broach district. The ginning percentage at Dudhathal was particularly low. Type 2334 had the lowest ginning percentage with longest staple. Amongst all the types tried, No. 98-41 seems to be promising for the combination of required economic character. Bulk seed of three extra early cultures with B. C. 1-2 (Vijay) as control was tried in replicated tests and early 22 was found to be promising for high yield of kapas and extra earliness as compared to Vijay. The ginning percentage of this type is 3 per cent lower than that of Vijay but this is made up in lint yield due to high yield of kapas. The performance of this type will be further confirmed.

(5) Cotton breeding at Viramgam—The trial of Kalyan cotton along with Wagotar and local Wagad was continued at Viramgam, Jagudan and Bavla. On an average, Kalyan was found to be superior to Wagotar and local Wagad in yield of kapas and lint per acre and also in staple length (0.90″ v/s 0-87″). The average spinning value (Matunga tests) for Kalyan is 27s as against 22s of Wagotar and 18s of local Wagad. The new synthetic plant material consisted of cultures for quality and earliness. In the quality group, of the 109 cultures studied, 81 were retained for further work. The best ones had the staple length of 0.94″ to 0.98″ as against

0.92″ for Kalyan. They had, however, lower yield of lint per acre than Kalyan due to lower ginning percentage. Two types, viz., 169 and 280, which have very nearly as good ginning percentage as Kalyan with better staple are considered to be promising. In the early group, there were 117 progenies under study. Of these, 88 cultures have been selected for further work, keeping in view the required agricultural characters. New crosses of Kalyan with long staple cultures, viz., 85, 168, 159 and 280, and with Vijay, were made during the year, the object being to further improve the quality of Kalyan cotton while retaining its high ginning percentage.

(6) Cotton breeding at Amreli for the improvement of Mathio cotton—As a result of research work done in the past, a strain named 'Pratap' is evolved by selection from local Mathio, which combines good yield, high ginning percentage and desirable quality. During the year under report, a large scale trial of Pratap and local Mathio showed that the former was on par with the latter for lint yield. It is superior to Mathio in respect of ginning percentage (34 per cent v/s 30 per cent), staple length (23 mm v/s 20 mm.) and spinning value 34s v/s 12s). The work on hand consists of crosses of Pratap with long staple arboreum types from Coimbatore and with C-520. From this material, sixteen progenies are promising. They have the ginning percentage ranging from 30 per cent to 35 per cent and staple length from 23.6 mm. to 25.3 mm. as against 33 per cent. ginning percentage and 23.2 mm. staple length of Pratap. Secondary selection in Pratap has given four families which have longer staple than Pratap (24 mm. v/s 23 mm.) Preliminary work of selection in the local American type, viz., Kadayo, grown in the Kodinar taluka of the Amreli district, was done during the year under report.

(7) Cotton breeding at Jalgaon.—Jarila and 197-3 were tried at eleven places in the district on varying types of soil. The results on an average show that 197-3 gave 11 per cent more yield of seed cotton than Jarila and had higher ginning percentage by 3 per cent. 197-3 gave better performance on rich and medium soils as compared to Jarila, but on light soil both were practically equal. Spinning test results of 25 centres of trial in 1948-49 show that on an average 197-3 has the staple length of 0.85″ as compared to 0.83″ of Jarila. It is, however, coarser, having the fibre weight of 0.186 $^{10-6}$ oz. as against 0.163 $^{10-6}$ oz. of Jarila. The average spinning value is lower by

one count. Lint samples of both the varieties from three centres of multiplication were sent to three different mills. 197-3 gave slightly lower spinning performance than Jarila. The mills, however, paid the same price for both the varieties. For seed cotton, the price realised for 197-3 was on an average Rs. 2-6-0 more per Bengali maund than Jarila. With these results, a scheme for the multiplication and distribution of 197-3 cotton in Khandesh has been sanctioned by the Indian Central Cotton Committee. However, an area of 20,000 acres under pure Jarila is to be maintained until 197-3 proves to be a successful substitute for Jarila. Of the 36 cultures of 197-3 tried, 8 have been giving better staple length than 197-3 general. One of these has fibre weight as low as Jarila. From the new-crosses made in 1948-49 to further improve 197-3, 225 plants having ginning percentage from 28.1 per cent to 46.2 per cent and staple length from 19.0 mm to 26.2 mm have been selected for further study, the ginning percentage of 197-3 being 38 per cent and staple length 23 mm. Ten promising cultures from the families of the backcross (Jarila × N. R.5) × Jarila were tried on a small scale replicated test with Jarila and 197-3 as checks. There was no significant difference in the yield of seed cotton. They have all longer staple than Jarila and 197-3. Five culture have the ginning percentage as high as 197-3. Their performance will be further confirmed. Jarila has been found to be a delicate cotton for growing over a large and varied tract like Khandesh for which different physiologically adapted types will be required and work in this direction is being developed.

(8) Cotton breeding at Dharwar (Kumta cotton Area).—The superiority of Jayawant was confirmed by trials at Dharwar. The scheme for replacing Jayawant with Jayadhar in the Kumta Cotton tract has already commenced. From a large number of cultures of crosses, backcrosses and complex crosses of K. F. T. 12-2-5 with other herbaceum types (7-1, 1027 A. L. F., B. D. 8, B. C. 1-2 and S-8), 23 cultures are found to have better combinations than Jayadhar. Lint samples of these are sent to the Matunga Laboratory for spinning tests. Fresh hybrid material, which also promises to give better combinations, consists of crosses and backcrosses of Jayadhar or K. F. T. with Surat herbaceum types (Suyog, 1-4 and 3652). Crosses with K. F. T. are particularly early and superior in yield and they will be studied at Bagalkot in the eastern tract of the Bombay Karnatak for which a cotton improvement scheme has been sanctioned by the Indian Central Cotton Committee.

(9) Cotton breeding at Gadag (Dharwar American Cotton Area)—During the past eight years, the trials undertaken to test Seg. 9-3 (Laxmi) against Gadag-1 showed that the former is superior to the latter by 15 per cent in yield of seed cotton, by 3 per cent in ginning outturn and by 30 per cent in lint yield. Its staple length is 0.94″ as against 0.83″ of Gadag-1 and it is adjudged suitable for 42,s as compared to 33,s H. S. W. C. of Gadag-1. A scheme for mutiplication and distribution of Laxmi cotton has been sanctioned by the Indian Central Cotton Committee. For further improvement of Laxmi, selective hybridization has been taken up by using reputed superior varieties like Co2, Co3, Co4, perso-American, M-4, Kampala, Jinja, etc., as parents in crosses. Study of the hybrid cultures made so far indicates a great difficulty in combining the high ginning outturn of Laxmi (viz. 36.8 per cent) with staple length above one inch. To overcome this difficulty, *inter se* hybridization amongst superior cultures differing in one of the requisite characteristics and hybridization between Laxmi and interspecific material from Surat (which combines high ginning percentage with staple length above one inch) have been taken up.

(10) Cotton work for the irrigated tract—In the Bombay Karnatak, work on cotton for the irrigated tract was so far confined to variety trials. In the beginning, Kumta was replaced by Gadag-1 which in turn was replaced by Co2 in 1936. Results of variety trials taken since 1942-43 show the superiority of Co4 over Co2 and other varieties compared. Hence multiplication and distribution of Co4 is undertaken. In the Deccan Canals area, it is planned to grow, in 1950-51, the Co4 variety with pre-seasonal irrigation on about 800 acres.

(11) Cultivation of Sea-island Cotton—Sea-island cotton was tried at Dharwar, Gadag, Arbhavi and at four places in Kanara. At none of the places it fared well due to the incidence of pests and diseases. Trials of sea-island in cocoanut gardens at Honavar gave some prospect of growing the variety as a subsidiary crop. Trial of hybrid seed of Co2×S.I and 9-3-× S. I. at Dharwar and Gadag showed that the former gave better quality while the latter gave comparatively better yield.

(12) Work on tree cottons—Preliminary observations on tree cottons grown at several places show that their successful cultivation will depend on the basic work that is required to be done with regard to the control of pests and diseases to which they are particularly prone to, suitable varieties or F1

hybrid combinations for particular soil and climatic conditions, and standardisation of pruning details.

(*ii*) *Tobacco Research.*—(1) Tobacco breeding at Nipani, district Belgaum—During the year under report, the bidi tobacco strains S-20-2 and S-12-2 were found to be better in yield and quality than Bhopali and Bagalani varieties. On an average, they are superior to Surati Local in yield and are of uniformly good quality. Both the strains are being tried in the district. Three F-3 cultures of the cross S-20 × S-57, three of S-12 × K-49 and two of S-112× K 49 are found to be promising for yield. Of the four cigarette varieties, viz., Harrison Special, Bonanza, Gold Dollar and Amrello 5, Am-5 was found to be good yielder but poor in quality. There was no significant difference in yield of the remaining three varieties which gave good performance in flue curing. They had good yellow colour and smooth textured leaf. Four cultures of the cross H. S. × Bonanza F-6, and three of H. S. × W. B. F-6, are found to be vigorous and promising for yield. A scheme for the co-operative development of cigarette tobacco in the Bombay State has been sanctioned by the Indian Central Tobacco Committee.

(2) Tobacco breeding at Boriavi, district Kaira (Now at Baroda)—As a result of the past work, improved strains of principal bidi tobacco varieties are available which give 10 per cent to 15 per cent higher yield than their respective locals. These strains are Keliu 49, Saijpuriu 57 and Gandiu 6. A strain named P-19 in piliu variety, which is known for its quality and which is earlier in ripening than those other varieties, is recently evolved and is found to give higher yield than Piliu local by 9 per cent. Average results of the past four years show that the derivative of the composite cross [(K-49-× S-57) F-1 × (K-49 × N-5) F-1] F-7 has given 20 per cent and 10 per cent higher yield than K-49 and S-57, respectively. The study of crosses of the high yielding derivative from the composite cross with K-49 and other varieties, showed that, of the four F-2s studied, (Composite Cross F-5 × K-49) F-2 gave the highest yield. Eighty-two individual plants from all the F-2s have been selected for further work. The scheme for multiplication and distribution of improved tobacco strains K-49 and S-57 in Gujarat has been sanctioned by the Indian Central Tobacco Committee.

(3) Cigarette tobacco work at Vijapur district, Mehsana—The exploratory work of growing cigarette tobacco at Vijapur

was financed by the Indian Central Tobacco Committee. The results show that cigarette tobacco can be successfully grown in Vijapur locality and that it is more profitable than bidi tobacco. The Indian leaf Tobacco Development Company, Ltd., has taken up the work of handling the cigarette tobacco crop of farmers for curing by purchasing the produce on commercial basis.

(*iii*) *Agronomic Experiments.*—(*a*) Surat Farm—The agronomic experiments on cotton mentioned in last year's report were continued with the following results:—

(1) Four varieties of cotton, viz. Suyog, Jarila, Co2 and B. C. 68, were grown under two spacings, viz. 4′×2′ and 4′×1′ with and without 'Nitrogen' (50 lbs. per acre). 'N' was applied in the form of sulphate of ammonia. There was pronounced increase in yield with the application of nitrogen it being particularly so with wider spacing in the case of Suyog variety (34 per cent increase under 4′×1′ spacing and 68 per cent increase under 4′×2′ spacing over no manure plots). This confirms the previous findings about the beneficial effect of sulphate of Ammonia.

(2) The six-year experiment to study the best rotation for cotton and jowar with and without legume (tur) and with and without farm-yard manure (5 cartloads per acre) applied to cotton and jowar, is in progress since 1948-49. This is only the second year of the experiment and hence the results are recorded for future analysis; and (3) the experiment on cotton —jowar rotation with intercropping of China mug in between cotton rows with and without phosphate applied to mug to enhance nitrification of soil with a view to seeing its effect on the succeeding *kharif* jowar, is in progress since 1948-49. China mug did not thrive well under Surat conditions and could not attain proper growth to allow the beneficial effects, if any, of phosphate on nitrification of soil.

(*b*) *Jalgaon Farm*—The agronomic experiments conducted on cotton on this farm were as under:—

(1) To study the Nitrogen and Phosphoric acid requirements of cotton with and without 5 cartloads of farmyard manure per acre. This was the second year of the experiments. 30 lbs. 'N' and 60 lbs. 'N' per acre was applied both in the form of sulphate of ammonia and groundnut cake and 30 lbs. 'P' and 60 lbs. 'P' per acre was applied in the form of superphosphate. The general trend of results so far is that the yield of cotton increases with the increased doze of 'N'. Some response to

phosphate is also obtained in Jalgaon soils; (2) to Study the best rotation for cotton and jowar with and without legume (Groundnut) and with and without farmyard manure (5 cart loads per acre) applied to cotton and jowar. This is the first year of the experiment and the results are recorded.

(c) *Dharwar Farm*—The following agronomic experiments were carried out on cotton on this farm:—

(1) To study the nitrogen and phosphoric acid requirements of cotton. The variety of cotton used was the new strain 'Jayadhar.' 30 lbs. 'N' and 60 lbs. 'N' per acre was applied both in the form of sulphate of ammonia and groundnut cake. No basic dose of farmyard manure was used. This is the first year of the experiment. The general trend of results show that there is no effect of P_2O_5. Application of 30 lbs. 'N' increased the yield by about 3 per cent and 60 lbs. 'N' by about 10 per cent. There was practically no difference as to kind of manure.

(2) To study the best rotation for cotton and jowar with and without legume (groundnut) and with and without farmyard manure (5 cartloads per acre) applied to cotton and jowar. This was the second year of the experiment and hence the results are recorded for further analysis.

(d) *Nipani Farm.*—In a rotational experiment wherein bidi tobacco followed the irrigated crops of sugarcane, chillies, turmeric and onion, tobacco after sugarcane, gave higher yield combined with quality, this year also. Tobacco after onion was late to mature as was the case last year. In spacing-cum-nipping experiment, close spacing of 42″×30″ and 14 leaves per plant gave higher yield than wider spacing with 10 or 12 leaves per plant thus confirming the findings of last year. There was no significant difference in yield this year between the treatments of harvesting the whole plant and 4 and 6 leaves at weekly intervals. Early transplantings, viz., 23rd July to 13th August, gave higher yield and were earlier to ripen than late transplantings. Seedlings of 4 to 6 weeks old gave higher yield and were earlier to ripen than older seedlings as was the case last year. In a rotational experiment wherein cigarette tobacco followed the dry crops of groundnut, tobacco, gram and jowar, tobacco after groundnut, gave the best yield and tobacco after gram was earlier to ripen. In the experiment of spacing-cum-topping, close spacing of 36″×24″ combined with topping at the inflorescence stage gave the best yield and quality.

(*iv*) *Seed.*—(1) Multiplication and distribution of suyog cotton in Surat tract (South of the River Narmada)—This scheme

which is in operation since the 1st April, 1945, is extended for three years from the 1st April, 1950. The area to be covered is nearly double of that originally proposed due to integration of the Baroda, Rajpipla, Sachin, Bansda and Dharampur States, During the year under report, the Agricultural Department controlled an area of 74,524 acres, including 471 acres pedigree area, out of the total area of 3,54,021 acres, and certified the produce from 46,001 acres. 25,34,870 lbs. of seed was distributed through groups, societies, gins and departmental depots. The number of pressed bales of certified Suyog cotton was 16,156, of which 210 were pedigree agmark bales. The premium realised comes to about Rs. 12 per bale of ordinary certified cotton and about Rs. 20 per bale of pedigree cotton over the uncertified.

(2) Multiplication and distribution of 1027 A. L. F. cotton in the Nawapur taluka of the West Khandesh district. This scheme is extended for further period of 3 years from the 1st April, 1950. Of the total quantity of 1,50,589 lbs. 34,969 lbs. of seed was distributed by the Agricultural Department and 1,15,600 lbs. by approved agents. Of the total cotton area of 8,440 acres, the area under departmental control was 3,509 acres, of which 3,225 acres were certified and 521 F. P. bales were agmarked and sold. The premium realised comes to about Rs. 12 per bale over the uncertified 1027 A. L. F.

(3) Multiplication and distribution of Vijay cotton in Middle Gujarat—This scheme is to continue till the 30th November, 1953. During the year under review, the total area under 'Vijay' was 3,66,210 acres (out of a total cotton area of 4,24,303 acres in Middle Gujarat, excluding the Baroda State). The Agricultural Department controlled an area of 34,790 acres including 1,208 acres grown with pedigree seed. The total quantity of seed distributed by the Agricultural Department during the year was 7,17,255 lbs. The Co-operative Cotton Sale and Seed Supply Societies had distributed 384,000 lbs. of seed. Thus the total quantity of Vijay seed distributed was 11,01,255 lbs. as against 15,88,345 lbs. in the previous year. This reduction was due to the prevalence of famine conditions in the tract during 1948-49. In all, 11,497 full pressed bales of pure Vijay cotton were obtained. Similar scheme which is in operation in the Baroda district, is also extended up to the 31st March, 1953. The Department distributed 19,82,400 lbs. of seed through 29 depots, while the approved merchants distributed 5,54,080 lbs. of seed. The controlled area was 41,624 acres, out

of a total cotton area of 2,78,000 acres in the Baroda district. The number of agmarked bales from the controlled area was 13,751. The produce from the controlled area fetched Rs. 2 to Rs. 8 more per Bhar (1,020 lbs.) of seed cotton. As recommended by the Indian Central Cotton Committee, the two Vijay Schemes will be amalgamated.

(4) Multiplication and distribution of Kalyan cotton in North Gujrat—During the year, 7,07,554 lbs. of Kalyan cotton seed was distributed in the Ahmedabad district. Of the total cotton area of 1,72,000 acres, 34,025 acres was covered as against 53,525 acres programmed for. The reduction is due to severe famine conditions prevailing during the previous year. About 95,080 lbs. of Kalyan seed was preserved by the Department to meet unforeseen contingencies. Similar scheme was in operation since the 1st February, 1949, in the Mehsana district. Here, of the total area of 75,000 acres, the area under Kalyan cotton was only 1,370 acres as against 2,411 acres programmed for. Kalyan cotton fetched a premium of Rs. 2 to Rs. 5 per 40 lbs. of lint over local Wagad. As per recommendations of the Indian Central Cotton Committee, the two Kalyan Cotton seed Schemes will be amalgamated.

(5) Multiplication and distribution of Jarila seed in Khandesh —During the year under report, 2,282 lbs. seed of Jarila was obtained from the I stage area of 14 acres on the Jalgaon Farm. The seed obtained from the II stage of 132 acres was 22,020 lbs. In addition, 924 lbs. pure seed of 197-3 was also produced on the Jalgaon Farm. Of the 42,57,760 lbs. of Jarila seed stocked under III and IV stages by the Department and approved stockists, 20,58,290 lbs. seed was distributed for sowing. The total area under Jarila, including natural spread, during the year was 2,27,185 acres as against 2,47,739 acres in the previous year. This reduction in acreage is due to the prejudice against Jarila and also due to the preference shown by cultivators for growing the more remunerative crop of groundnut. The controlled area was 92,458 acres. As per notification dated the 29th April, 1950, of the Government of Bombay, restrictions placed under Cotton Control Act of growing only Jarila variety in the Khandesh Protected Area were removed. A new scheme for multiplication and distribution of 197-3 cotton in Khandesh for replacing Jarila has been sanctioned by the Indian Central Cotton Committee.

(6) Multiplication and distribution of Jayawant and Gadag No. 1 cotton in Bombay-Karnatak—This scheme has been

replaced by a new scheme for multiplication and distribution of Jayadhar and Laxmi cottons. In order to maintain the purity of seed, 74,959 acres under Jayawant, 7,447 acres under Jayadhar, 13,121 acres under Gadag No. 1 and 5,624 acres under Laxmi were organised as reserved areas. In all, 38,98,020 lbs. seed of Jayawant, 1,24,320 lbs. of Jayadhar, 9,19,300 lbs. of Gadag No. 1 and 66,800 lbs. of Laxmi were distributed. The total area, including natural spread, under Jayawant was 5,05,322 acres, under Jayadhar 17,222, acres, under Gadag No. 1 1,52,037 acres and under Laxmi 6,736 acres, all under departmental control. During the year, 19,022 docras (1 docra=300 to 400 lbs.) of Jayawant kapas, 9,299 docras of Jayadhar, 10,978 docras of Gadag No. 1 and 4,016 docras of Laxmi were graded and sold by organising 112 auction sales at various marketing centres. The premiums obtained for Jayawant and Gadag No. 1 were Rs. 10 to Rs. 15 and Rs. 20 to Rs. 30, per bag (1,344 lbs.) of kapas respectively, over the ungraded stuff. The premiums realised for Jayadhar and Laxmi cottons were Rs. 40 to Rs. 80 and Rs. 200 to Rs. 250 per nag of kapas over the graded kapas of Jayawant and Gadag No. 1, respectively.

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PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Cotton breeding at Surat and Shera.—

(*a*) Trial of types 77-2, 3652, 2334 and 2087 with Suyog and 1027 A. L. F. as controls at Surat, Vesma and Shera Farms and on cultivators' fields;

(*b*) Working up of the material from crosses and backcrosses of 3,652 with long staple types;

(*c*) Production of selfed seed of Suyog and 1027 A. L. F.

(2) Scheme for interspecific hybridization in cottons at Surat.—

(*a*) Trial of promising interspecific material at Surat and other stations under rainfed and irrigated conditions.

(*b*) Study of back-crosses involving wild types;

(*c*) Study of crosses and backcrosses between G. hirsutum X G. barbadense;

(*d*) cytological work in connexion with—(i) Synthetic hexaploids in relation to fertility, and (*ii*) crosses of G. anomalum with asistic and American cottons.

(3) Broach cotton Breeding Scheme.—

(*a*) Study and trial of promising material from crosses on the Broach and Dabhoi Farms;

(*b*) District trials of important types; and

(*c*) production of selfed seed of Vijay.

(4) Cotton breeding at Viramgam, Jagudan and Bavla.—

(*a*) Study and trial of promising material from crosses for quality and earliness with Kalyan as control, and

(*b*) Nucleus seed multiplication of Kalyan.

(5) Improvement of Mathio cotton at Amreli.—(*i*) Study and trial of promising material from (*a*) secondary selections in Pratap, (*b*) cross of C-520 × Pratap, (*c*) Pratap × Madras arboreums and (*d*) Jalgaon types; and

(*ii*) Production of selfed seed of Pratap.

(6) Cotton breeding at Jalgaon.—(*i*) Study and trial of promising material from (*a*) secondary selection in Jariia and 197-3, (*b*) back cross of J × (J × N. R. 5) and other crosses, and (*c*) outside arboreum types; and

(*ii*) district trials of 197-3 and Jarila in representative soils.

(7) Cotton breeding at Dharwar (Kumta cotton).—(*a*) comparative tests of Jayawant and Jayadhar to be continued; and (*b*) trial of promising cultures from various crosses and comparison of their spinning performance.

(8) Cotton breeding at Gadag (Dharwar American cotton).—Study and comparison of (*a*) sub-selections from 9-3, and (*b*) crosses involving outside American types and Interspecific material from Surat.

(9) Tobacco breeding at Nipani.—(*a*) Study and trials of bidi and cigarette tobacco types, (*b*) F-4 cultures of crosses of bidi tobacco types and (*c*) F-7 cultures of crosses of cigarette tobacco types.

(10) Tobacco breeding at Baroda.—(*a*) Trial of promising types of Piliu variety with local Piliu, (*b*) Study of selections from the crosses of improved bidi types with the high yielding derivative of the composite cross; and (*c*) multiplication of improved strains K-49 and S-57.

(11) Agronomic experiments.—(*a*) Continuation of the manurial and rotational experiments on cotton in progress on the farms at Surat, Vesma, Dabhoi, Jalgaon, and Dharwar; and (*b*) Continuation of the cultural and rotational experiments in progress on bidi and cigarette tobacco on the Tobacco Breeding Station, Nipani.

(12) Multiplication and distribution of improved cottons, viz. Suyog, 1027 A. L. F., Vijay, Kalyan, Jarila, 197-3, Jayawant, Jayadhar, Gadag No. 1 and Laxmi in their respective zones.— (*i*) Multiplication of pure seed obtained from Government Farms through registered growers at different centres under departmental supervision; (*ii*) distribution of the resultant seed at different centres through departmental depots or co-operative Societies, (*iii*) inspection and roguing of controlled cotton area under different stages; (*iv*) supervising, grading, ginning and pressing of the produce and certifying or agmarking bales of pure cotton; (*v*) stocking of seeds departmentally or through approved agents, Co-operative Societies, etc. for further multiplication and distribution; and (*vi*) working of the different cotton Acts and issue of licences for transport of cotton into protected areas for *bona fide* purposes of feeding and manufacturing.

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Appendix XIV

Summary of the Work done under the Soil Physicist to Government, Bombay State, Poona, for the year 1949-50

A. *Staff and Administration.*

Dr. J. K. Basu continued as Soil Physicist to Government during the year under report.

In the problem areas of the state the conservation of soil and moisture is of utmost importance to stabilise crop yields. The average yields of crops of the tract are proverbially low due to vagarise of rainfall and impoverished soil condition resulting from age-long processes of soil erosion. Further, there are stretches of intractable soils which have developed salinity due to aridity of climate and require amelioration from restoring their productive capacities. In the present food drive some of the soils of the problem areas are being brought under irrigation and careful soil surveys are essential for classifying these soils for their proper land use. These problems are being investigated in the Soil Physicist's Section under the following heads:—

(1) Dry Farming Research; (*a*) Agronomy, (*b*) Chemistry; (2) Contour strip cropping; (3) Soil Erosion; (4) Alkali Soil and (5) Soil Survey.

Besides these the soil physicist is entrusted with the Training in Soil Conservation and extension work in Dry Farming. A short summary of the above work conducted during the year 1949-50 is presented here.

B. *Dry Farming.*

(1) Agronomy.—The rainfall during the year was 38 inches against the average of 26 inches. In spite of heavy rainfall the distribution was abnormal which affected most of the kharif crops unfavourably. Bajri, groundnut and pulse crops with the exception of Tur suffered due to heavy rains. Rabi sowings were delayed due to continuous rain and further the seedlings suffered due to heavy showers soon after the germination. Complete absence of rains afterwards put a severe test to Dry Farming method but the rabi yields justified the superiority of the method over the local practice.

During the year a rotational experiment on Bajri was laid out. The major experiments on Rabi Jowar viz. frequency of ploughing, frequency and time of harrowing and interculturing, frequency and dose of manuring, technique of groundnut cake and green manuring, rotational trial and maximising crop productions were continued during the year. Ploughing experiment has completed its fourth year and once again it was confirmed that ploughing is no way superior to harrowing. In frequency and time of harrowing series it is found that as the season was late July and August harrowings have shown good result which corroborated our last year's finding. This year in the time of interculturing experiment it was not possible to give all treatments. In technique of sann green manuring it is found that 5,000 lbs. of either sann or compost has proved superior to control. In the groundnut cake manuring experiment 25 lbs. of N. per acre of groundnut cake when applied 15 days earlier has proved superior to control where cake was put at the time of sowing. In large scale trials of maximising crop production it is found that 25 lbs. of P_2O_5 and 25 lbs. N. as cake has increased yield by 62 per cent over local while B. D. F has shown. 28 per cent increase over the same. At sub-stations maximum yields of 1,653, 1,036 and 1,540 lbs. per acre have been obtained at Jeur, Chas and Bijapur as against the control yields of 731, 291 and 1,045 lbs., respectively, by the application of suitable combination of manure.

(2) Chemistry.—The chemical aspects of the agronomic experiments in the dry research farms were investigated in the

Central Laboratory at Mulegaon. Some special features of the work are given below:—

Two timely harrowings, namely July-August, conserved the maximum moisture in the soil, i.e., between 40-45 per cent while the control treatment (four harrowings) conserved only about 35 per cent moisture. Sann green manure with 5,000 lbs. per acre which has given highest yield of Jowar showed definitely higher nitrate figures than the control. In the groundnut cake experiments, 25 lbs. N. per acre when given in rows, 15 days earlier has shown higher nitrate figures than the control resulting in higher yield of jowar. In the experiments with rare elements application of manganese sulphate gave about 25 per cent higher yield of groundnut at Sholapur. The application of zinc to gram at Sholapur and Chas has shown promising results, particularly, at Chas where the increase in yield is about 53 per cent over the control. Studies in Run-off with Bajri-Tur as entire crop in all plots (previously rotated with different strip crops) showed that the results obtained this year still reflect the beneficial residual effects of Bajri-Tur-3N Matki and groundnut (entire crop) in maintaining waterstable soil structure and controlling soil erosion.

C. *Contour strip cropping*

The research work was continued at the six centres, namely, Mulegaon in Sholapur, Jamkhed in Ahmednagar, Borgaon in Satara, Kolhar in Bijapur, Abbegeri in Dharwar and Saundatti in Belgaum district. Though there were some abnormalities in the climatic features the performance of the crops was generally satisfactory at all centres except at Saundatti where crops pests were serious. The major problems tackled at these centres are the selection of suitable cover crops for the tracts and the findings out of the optimum seed rate and widths of erosion-resisting strips; measurements of run-off and canopy development and trial of grasses for stabilisation of bunds. The seed rate of 5 Normal Matki has given increased yields where there was high rainfall as at Mulegaon and where the rainfall was low as the Abbegeri the Normal Matki has fared better than 3 and 5 Normal. The increased seed rates of Hulga has given more yield than the Normal at Mulegaon, Borgaon and Abbegeri. The widths of erosion resistant strip seem to have some effect in increasing the yield of Non-resistant cereal crops of Jowar and Bajri. The rotational effect of groundnut, Hulga and Matki on the succeeding crop of Jowar and Bajri is clearly demonstrated

from the increased yields. The run-off and erosion studies indicate that wider strips and increased seed rates are necessary for effective erosion control. At Mulegaon 24 feet Hulga 5 Normal has proved to be the best. Splash values indicate that the Matki gave the least splash at most centres. With the lowerings of the seed rates splash values are increased. Grass trials both in the nursery and on the bunds were conducted. Root studies indicate that Blue panic (Panicum antidotale) produced the maximum amount of roots in the 0 to 9" layer at Mulegaon. Marvel, weeping love grass, Blue panic and Sudan Grass were planted on the bunds and success of varying degrees have been obtained at different centres.

D. *Soil Erosion Studies*

The following items of research work were continued during the year at the Land Improvement Research Station at Sholapur and its sub-centres at Tembhurni, Alkolner and Kaladgi. Soil fertility as affected by bunding and erosion was studied in the inter bund distance by growing crops and soil analysis. In the deep black soils crops yields in successive half foot sub-plots down the slope in the inter bund distance showed a gradual increase while in the light of medium soils the same showed a certain amount of irregular variation, giving a sort of a banded character to the fertility status of the interbund area.

Soil erodibility experiment in small plots of three different lengths was undertaken with a view to study erosion under field conditions. The soil loss in terms of tons per acre in different soils, indicates that the deep black soils of Kaladgi are very highly erodible compared to the light or medium soils. The erosion loss shows a decrease with distance in all soils. The fact that the deep black soils in dry condition erode easily but once wetted develop a considerable resistance to further erosion, is once again confirmed. The study of the phenomena on small catchment basis is considered essential to supplement the data from the small plot studies and hence standing wave flumes and automatic discharge recording instruments have been obtained for installation at the farm. A "rainfall simulator" is set up for studying susceptibility of different soils under controlled conditions of rainfall slope etc.

Soil permeability experiment by Tube ariols was put as a routine study throughout the year at the Sub-stations. The deep blank soils are far less permeable to rain water as compared to the light or medium soils. Gypsom, F. Y. M. and

groundnut have shown a good response in increasing the rate of percolation at Akolner and Tembhurni.

An additional area of 17,355 acres at eight centres in the scarcity tract have been surveyed during the year. The progressive total area so far surveyed has gone just over 80,000 acres distributed in 43 centres. The fact that the percentage figures of areas under various stages of erosion, viz., uneroded, moderately eroded and highly eroded have remained more or less constant when calculated on the total of each year, shows the greater representative character of the survey as also the truer conditions of the agricultural land in the tract.

E. *Alkali Soil research*

Investigations on Karl Soils, consisting of agronomic and chemical experiments at the Karl Soil Reclamation Farms at Kanginhal and Nargund in Dharwar district were continued during the year. The kharif crops could not be grown due to deficiency of rains while rabi crops were normal due to adequate distribution.

In the agronomic experiments a clear superiority of Jaywant variety of cotton was noticed over Gadag No. 1 at Nargund while no significant difference in yields could be noticed in both the varieties at Kanginhal. However a wider spacing of 30″ between rows has given a decidedly higher yield of cotton at both the farms. In case of rabi Jowar (M-35-1), 18″ spacing with 2 interculturings and a higher seed rate of 8 lbs. per acre has given better yields of grain at Nargund. In the case of wheat higher seed-rate of 40 lbs. per acre seems to be desirable. As regards spacings, so far there is nothing to choose between 14″ and 18″. Wheat No. 808 has proved superior to local red variety at Nargund while at Kanginhal local red gave slightly higher yield. Other crops like gram and linseed gave fairly good yields as in case of the previous year.

In the chemical series the treatments of sulphur and F.Y.M. in different doses have shown remarkable improvements in soil structure and absorption of rain-water. The physico-chemical properties of the soils showed definite improvements by way of reduction in alkalinity and sodium saturation in the plots treated with sulphur plus F.Y.M. No such improvements could be noticed in control. A new experiment with various doses of sulphur with a common basal dose of 2,000 lbs. of F.Y..M. per acre has shown good indication that better crop yields of jowar could be obtained by treating the soil with

lower doses of sulphur e.g. 1 cwt. or 2 cwts. before monsoon and taking a rabi crop of jowar in the subsequent season. In order to study the nature and formation of Karl soils, profiles examined on *Catina* basis at two places at Nargund from good to bad soil, reveal that the normal fertile soil has a black soil layer extending to great depth with desirable structure, while degradation takes place as the depth of the black soil diminishes down the *catina* through erosion exposing accumulations zones of calcium carbonate and soluable salts. The structure of the surface soil subsequently deteriorates due to high alkalinity and excess of exchangeable sodium due to upward mobilisation of sodium salts from the impervious 'B' horizon. Contour cultivation, contour listing or bunding helps to check further deterioration of these soils as well as facilitates proper absorption of rain water to get increased crop yields.

Alkali Soil Research in Gujarat.—After the merger of the Baroda State with the Bombay State, the reclamation Farm at Harij in the Mehsana district was transferred to this Section. The farm is located on a highly saline soil, representative of the tract, and the ameliorative methods will include leaching out of salts (by rain water) and improvement in soil structure by chemical and agronomic practices. For a study of the nature of the soils a number of profiles has been examined.

F. *Soil survey*

The object of the scheme was to carry out the survey and classification of lands under the command of Lift Irrigation Projects in the Bombay State, according to their suitabilities for irrigation, ultimately with the object of adjusting the quantities of water to be applied to the lands from the point of view of economising the water as well as preventing damage to the land. During the first year of the Scheme, the survey of the important projects in priority order, was taken up. In the preliminary stages, the staff was trained in the work, and suitable procedure for field work and chemical analyses was laid out. A system of classification of the lands on the basis of the combined information, dividing them into six classes was also worked out. Thirteen projects were surveyed, (3 of them partly) covering a total area of 23,730 acres during the period from 1st June 1949 to 30th May 1950. Out of these, soil maps prepared according to the above classification were submitted for 6 projects, covering 11,600 acres, while preliminary analysis was completed for a further 5 projects. The

distribution of irrigation water and laying down of cropping programmes have been entrusted to the District Staff on the basis of these maps.

G. *Training and extension work*

At the Soil conservation Training Institute, Sholapur, four officers from Madras and two officers from Hydrabad have undergone training in all aspects of Soil Conservation.

In connection with the extension work on dry farming two conferences were called by the Soil Physicists to Government at Sholapur and Baroda in the month of March, 1950, which were attended to by the District Agricultural Officers of the dry districts of the Deccan, Karnatak and Gujarat, respectively. The present situations in the districts were critically examined and the possibilities of introducing improved dry farming methods were discussed. A complete schedule of operations for dry farming and contour strip cropping was given to the District Agricultural Officers of the Deccan and Karnatak zones. Intensive training was also imparted to the staff of the District Agricultural Officers in May and June. For Gujarat a scheme of research work on dry farming was prepared and a part of the scheme will be implemented this year.

J. K. BASU,
Soil Physicist to Government,
Bombay State, Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Dry Farming.

(*a*) *Agronomy*—

1. Frequency of ploughing, harrowing, interculturing.
2. Manuring—cake and green manuring.
3. Maximising crop production.
4. Roattions—Kharif and Rabi.
5. Large scale maximising, B. D. P., v/s. cultivators.

(*b*) *Chemistry*—

1. Chemical investigations in all the cultural, manurial and rotational experiments. (*Vide* agronomy section.)

2. Effect of Phosphatic fertilisers and mode of application to Legumes and its effects on succeeding crop.

3. Effect of trace elements—Manganese, Boron and Zinc on Legumes and Cereals.

4. Studies of run-off under controlled condition.

(2) Contour srip cropping—

1. To find out the most suitable economic cover crops including perennial grasses, shrubs, etc. in different tracts.

2. To investigate the most suitable widths and seed rate of erosion resisting crops in combination with erosion permitting ones for different soil types, gradients and climatic variations.

3. To study the trend of fertility change in the stripped areas.

4. Intensification of grass, trials in stabilising conservation structures such as bunds, waste etc.

(3) Soil Erosion—

1. Continuation of soil fertility, soil erodibility and soil permeability experiments with some improvements in the technique of observations.

2. Study of run-off and erosion taking place from small agricultural areas with the standing wave flumes and Automatic discharge recording instruments in relation to amount and intensity of rainfall.

3. Study of the behaviours of different soils towards susceptibility to erosion under controlled conditions of precipitation, slipe, etc. with the help of rainfall simulator.

(4) Alkali Soil reclamation—

1. Effect of varieties, spacings, cultivation, etc., on various crops and soils.

2. Trial of crops.

3. Effects of sulphur and F. Y. M. alone and in various combinations in the amelioration of alkali soils and on growth of succeeding crops.

4. Study of the nature and formation of alkali soils in connection with soil survey and classification of alkali soils.

(5) Soil survey—

1. District-wise surveys on zonal basis will be undertaken for identification of genetic soil types.

(6) Training and Extension work—

Soil conservation training will be imparted on a modified syllabus and certificate of completion of Training will be awarded to successful candidates under the signature of the Hon'ble Minister for Forests and Agriculture, Bombay State.

The extension work on dry farming will be intensified in all the dry districts.

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APPENDIX XV

Summary of the work done under the Sugarcane Specialist, Sugarcane Research Scheme, Padegaon, for the year 1949-50

A. *Staff and Administration*

The scheme of Agricultural Research Station, Padegaon, which was to be terminated on the 30th June, 1949, was further extended for a period of six months by Government under the expectation that the Indian Central Sugarcane Committee would start the comprehensive Sugarcane Research Scheme as approved by that Committee during the period. As no approval was received from the Committee for a long time, the State Government decided to undertake a part of the programme of the comprehensive Sugarcane Research Scheme and accordingly, appointed Dr. R. G. Rege, Deputy Director of Agriculture (Research and Education) as Sugarcane Specialist in November, 1949, to carry out this programme. He was also put in charge of the Sugarcane Development Scheme which was in operation since August, 1948.

B. *Sugarcane Research Scheme*

(1) Soil Physics Section.—

(I) *Investigations into the causes of soil deterioration and nature of soil improvement under irrigation, manuring and cropping*:

(*a*) *Soil charges under continuous irrigation and manuring.*— The experiments are in progress since 1932 without any crop with varying doses of water from 70 to 120 acres inches, and different types of manures. There has been an higher loss of calcium carbonate and lower C/N ratio with increased dose of water. Considering all the soil factors the continuous irrigation for the last seventeen years has not shown any harmful effect on soil so far. On the other hand there has been an increase of 36 per cent in Nitrogen and 87 per cent in humus content as compared to the original samples. As regards the manures the total nitrogen, humus and available P_2O_5 are found to be the highest in the farmyard manure treated plots as compared to the other nitrogenous manures artificial as well as organic. Super phosphate has given 8 per cent higher availability of P_2O_5 as compared to bone meal and sulphate of potash 33 per cent more availible potash as against muriate of potash.

(b) *Soil charges under continuous cane cropping and fallowing.*—This experiment has been in progress in all the three types of soil light medium and chopan. As the variety POJ 2878 continued to give very poor yields it was replaced by Co.419 during the year under report. With this change in variety cent per cent higher yields have been obtained in the case of medium and light soils in the manured cane while in chopan soil the yields are similar to those of the previous year. Soil studies have shown an increase in humus, nitrogen, exchangeable calcium and available phopshhate in manured cane crop as against the unmanured one. Among the fallows, manured and irrigated fallows have shown a high value for nitrogen while uncultivated and unirrigated have shown harmful effect by way of increased C/N ratio.

(c) *Soil changes under rotational crops.*—The cultivation of the same crop year after year has given decreasing yields as compared to the rotational cultivation both in the leguminous and non-leguminous crops. The soil studies have further shown a higher nitrogen content when rotation has been observed as against the continuous cultivation with the same crop.

(II) *Lysimeter studies on soil types*:

The analytical work on soil properties has been carried out in the case of sann canes series after harvest of cane. Humus status has shown an increase in D, F and C types while B, D, F gave higher values for nitrogen. In the phosphatic series A and B have given higher humus content.

(III) *Soil studies in experiment with varying ratios of sulphate of ammonia and cake with and without the basal dressing of compost*:

This is the fourth cycle of a long term farm experiment the yield data of which has been discussed under the Agronomy Section. Among the various soil properties humus has shown a definite fall under all treatments in no compost series. Similar indications have been also obtained in the case of nitrogen. No appreciable variation has been observed among the varying treatments in the case of top-dressings.

(2) Crop Physiology Section:

(I) *Bio-climatic.*—The heavy rain fall received during the latter fortnights of September (6".65) and October (6".76) and the low average minimum temperatures during the months of

November and December brought in early maturity and consequently the sugar and gur recoveries have been much higher than in the previous year. The micro-climatic investigations were continued on Co.419 and POJ 2878 and the data so collected was supplied to the Director of Agricultural Meteorology for working out co-relations.

(II) *Rain water versus canal water.*—A replicated pot culture experiment to find out the relative value of rain water and the canal water in the irrigation of sugarcane was continued with Co.419. The results have shown three times higher yields (3.4 lbs.) in the case of rain water as compared to canal water (1.1 lb.). In the treatment in which rain water was sprayed on the crop after collection the yield was only 1.4 lb.

(III) *Mineral Nutrition.*—This is the third year of the detailed investigation in the mineral nutrition of the October planted cane (Co.419). As in previous years there has been a beneficial effect of higher manuring on the height of cane till earthing up time. This was not, however, maintained after earthing up and 325 lbs. Nitrogen showed an accelaration of growth over the other treatments with the increase in the height per cane at the time of harvest by about 3″ over the other two treatments. The yield data have shown higher yields (55.3 tons) in the case of 475 lbs. Nitrogen as against 51.7 tons in the case of 325 lbs. Nitrogen which is at variance with the previous results. This has been found to be due to less lodging observed during year under report as against previous years. The total uptake of Nitrogen in the different treatments has been 50.6, 42.6, and 35.1 per cent respectively in the case of 325, 400 and 475 lbs. Nitrogen. The uptake of P_2O_5 and K_2O has been, however, higher in the case of higher nitrogenous treatments. The periodical analysis of juice for sucrose has shown early maturity in the case of the lower dose in which the crop was ready for harvest by about the end of November. In the case of the other treatments there has been a delay of about a fortnight to one month in attaining maturity.

(IV) *Maturity study in different types of cane setts.*—From the standpoint of tonnage the middle setts have shown the highest yield while the top and bottom setts have given practically similar yields. The results are in variance with the previous years data when practically no difference was obtained in the yield from different types of setts as well as the whole cane. As regards maturity top setts showed early maturity by about 10 days only, which was not of much significance.

(V) *Physiological behaviour of soil types.*—This research work has been carried out in lysimeters and the series under investigation during the year under report had a rotation of sann-cane as against cotton-cane. There had been a very high response to phosphate in all the types even including F, which had not shown response to phosphatic manuring during the previous years. The increase in the yield has been observed to be due to more number of canes in the phosphatic series.

(VI) *Manurial investigation on paddy crop.*—This is the second year of the experiment with the doses of Nitrogen varying from 32 lbs. to 192 lbs. Tillerings has been observed to a maximum in the case 160 lbs. N, while the highest yield has been obtained in the case of 192 lbs. N (3,608 lbs.) although it is not significant as compared to the other treatment (3,471 lbs.) the weight of 1,000 grains has been low up to 64 lbs. Nitrogen after which there is practically no difference in the higher treatment. Increase in quantity of protein in grain has been observed with increasing quantities of nitrogenous doses.

(3) *Agronomy section.*—

(I) *Sugarcane varietal trials.*—55 seedling canes with serial numbers 690 to 744 which were received from Coimbatore in March were under multiplication. Among the varieties in the prefinal trials Cos. 647, 650, 655, 658 which showed superiority in yield over Co. 419 were promoted to the final trial during the year 1950-51. Co. 467 which showed higher yield over Co. 419 in the final trial was not found to be suitable in the mill test owing to high fibre content and was, therefore, discarded.

(II) *Manurial investigations.*—(1) *Ratio of S/A to cake N with and without compost as basal manure.*—This is the eleventh year, with the fourth rotational cycle of the experiment. The cumulative effect of the compost has been distinctly indicated by the high yield in the case of S/A alone (49.4 tons) which is now equal to that of cake alone (49.2 tons). The yields in the same treatments without compost have been 20.5 and 40.9 tons respectively. The higher proportions of S/A to cake (2:1) has given still higher yields with compost (55.7 tons).

(III) *Irrigational investigations.*—In the water-cum manure experiment on the Adsali planting 115 acres inches have yielded higher than 130 acre inches. The beneficial effect of shorter intervals of irrigation during hot weather has been also reflected in the cane tonnages. In the case of nitrogenous manure,

450 lbs. N has yielded significantly more than 375 lbs. N and even more than 525 lbs. The results are in consonance with the previous two years' data, clearly indicating the optimum dose of water and manure to be 115 acre inches and 475 lbs. N.

(*IV*) *Experiments on crops other than sugarcane.*—Varietal trials with paddy, which completed the third year with this year's experiment has shown significant superiority of Dodki 2,604 lbs.) closely followed by Krishnasal (2,335 lbs.) Muskhan and Basmati have given practically half the yields of the above mentioned varieties. In the case of cotton 197-3 has given higher yield (1,599 lbs.) as compared to the Jarilla (1.477 lbs) Co. 4 which has yielded 1,118 lbs. will be. however, more profitable to grow owing to its better staple length. Among the interspecific cotton strains 134 CWF 8 Bulk has given significantly higher yield over Jarilla.

The spacing cum sowing date experiment with wheat crop has shown no significant difference in spacings in all the sowings. Among the sowing dates the treatment two weeks after normal date have given slightly higher yield than the normal sowing. The N. P. series with four levels varying from 0 to 96 lbs. N and P_2O_5 with wheat has shown an increase in yield with increasing doses of N. As regards P_2O_5 the dose of 32 lbs. has shown good response.

C. *Sugarcane Development Scheme*

This is the second year of the scheme partially financed by the Indian Central Sugarcane Committee; the activities under the scheme consist of (*i*) trials of the results obtained as a result of the research work at Padegaon, under different soil-climate complex and multiplication of improved varieties at sub-stations for the distribution of reliable and disease free seed, (*ii*) establishment of seed nursaries, (*iii*) crop protection against insect pests and crop diseases, (*iv*) soil survey and (*v*) hire of implements and general advice to the cultivators. At the sub-stations the replicated trials on (*i*) water-cum manure, (*ii*) the value of compost in relation to top-dressing and (*iii*) varietal trials in different plantings were continued. The improved varieties Cos. 419 and 475 were also multiplied and 7,40,650 three budded setts were supplied to the sugar factory estates and cultivators for a further multiplication. Top shoot borer (schirphophaga sp.) which is rapidly spreading over the Deccan Canal Tract was very severe on the Belvandi Sugar Farm. Mechanical measures such as cutting and destroying the

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affected plants collection of egg masses have been undertaken to control this pest and the results have been promising. The soil section has carried out a survey of 25,000 acres during the year under report.

R. D. REGE,
Sugarcane Specialist,
Sugarcane Research Scheme,
Padegaon.

PROGRAMME OF WORK FOR THE YEAR 1950-51

The work will be mainly carried out on the Adsali and October plantings.

(I) *Biochemical section.*—

(*a*) Elucidation of factors which determine the higher tonnage in relation to higher sucrose content; periodic mineral requirement of the crop with a view to evolve suitable systems of manuring.

(*b*) Bio-climatic studies.

(*c*) Causes of formation of water shoots in cane-crop and methods of controlling same

(*d*) Factors determining the quality of gul and methods of improving the same.

(*e*) Effect of minor elements.

(II) *Soil physics section.*—

(*a*) Soil changes due to intensive cultivation with sugarcane, irrigation, manuring, rotation, etc.

(*b*) Reclamation of chopan soils.

(*c*) Studies in different soil types from the standpoint of phosphatic and potassic manuring.

(III) *Agronomy section.*—

(*a*) Varietal trials.

(*b*) Agronomic experiments on irrigation and manuring both in top-dressing and basal manures, spacing-cum manure and rotations. Fourteen experiments have been planned on sugarcane. Besides similar experiments have been planned for paddy, cotton, wheat and jowar.

R. D. REGE,
Sugarcane Specialist,
Sugarcane Research Scheme,
Padegaon.

APPENDIX XVI

Summary of the Work done under the District Agricultural Officer, Poona, for the year 1949-50

A. *Staff and Administration*

Shri T. B. Pawar held charge of the post of District Agricultural Officer, Poona, during the year under report, and carried out the work of all the 'Grow More Food' schemes and other agricultural activities in the district with the help of five Agricultural Officers, one Assistant District Agricultural Officer and seventy Agricultural Assistants.

B. *Season*

There were no ante-monsoon showers during the year with the exception of few sprinkling showers. The commencement of the monsoon was rather late and did not gather strength till the 15th July, 1949. Sowings of bajri were done late and the transplanting of paddy was late by about a fortnight. However, there were some showers in the month of August, which helped the crop of bajri. The rains in the month of September were very helpful for standing crops and for sowing of *rabi* crops of jowar, wheat and gram. During the month of October, there were intermittent showers all over the district which were helpful for the paddy crop. There were practically no rains in the month of November and no sooner the rains stopped the cold weather set in immediately which was rather helpful for the crop of wheat. In short, the rainfall was rather late and scanty, but it was timely. There were no diseases of any serious nature during the year, except for stray attacks of blast disease on paddy and aphis on peas in the *kharif* season. This year was exceptionally good for the wheat crop as there was no rust which had devastated the crop during the previous two years.

C. *'Grow More Food' Campaign*

(*a*) *Improved seeds.*—The schemes for the distribution of *rabi* jowar and chafa gram seed have reached the fifth stage and that of wheat (irrigated) has been commenced from last year freshly due to prevailance of rust. The extension of area under these improved seeds is as follows:—

Crop.	Target quantity.	Quantity actually distributed.	Area covered.
	Mds.	lbs.	Acres.
Paddy	165	162	324
Bajri	1,500	1,631	16,310*
Jowar M-35-1	8,840	7,908	79,080
Wheat N-4	180	255	255
Wheat Dry	20	20	40
Gram Chafa	1,162½	1,080	2,161

*Seed received from the Ahmednagar district was more and the same was distributed.

(*b*) *Foodcrops Act and its application.*—Poona district is growing more than the stipulated area under foodcrops. Under this act, the area under non-foodcrops is restricted to 1/5th of the total holding. The application of this act has also helped to increase the area under foodcrops in this district.

(*c*) *Distribution of manures.*—During the year under report. 3,231 tons of groundnut cake were distributed for foodcrops and the area covered was 32,279 acres. The total quantity of special manure mixture distributed was 3,396 tons to cover an area of 27,172 acres. About 275 tons of sulphate of ammonia was distributed for foodcrops to cover an area of 3,812 acres and 1,987 tons of potato mixture was distributed, which was sufficient for 6,444 acres.

(*d*) *Compost development work.*—Rural Compost Scheme work was taken in 136 villages and the total number of new pits dug was 14,140. Of these, 12,627 pits were filled in during the year producing 31,567 tons of compost. Under the Town Compost Scheme, 11 Municipalities undertook the work of preparing compost and in all 26,103 tons of compost was sold during the year.

(*e*) *Construction of wells.*—The District Rural Development Board continued to control the work of the scheme. During the year, 112 new wells were constructed and 42 old wells were repaired, and the total amount of tagai sanctioned during the year was Rs. 6,36,924

(*f*) *Propaganaa and publicity including shows.*—A Sarvodaya Exhibition was held at Talegaon Dabhade in the month of October, under the Presidentship of the Hon'ble the Chief Minister. A District Agricultural and Cattle Show was held at Jejuri on the 3rd and 4th February, 1950. This show was opened by the Hon'ble Minister for Forests and Agriculture. All the sections of the Department took part in it and the cultivators from the surrounding villages came to see the exhibits in large numbers.

The tree-planting week was celebrated in the month of August, and 23,000 indigenous fruit and shade trees were distributed free of cost to the cultivators. 150 coconut trees were distributed to the villages of Khanapur in the Haveli taluka.

(*g*) *Pests and diseases.*—No serious pest was reported, except that of Blast disease on paddy in some parts of the Mawal taluka. This year was singularly free from the attack of rust on wheat. The Assistant Shikar Officer, working under the District

Rural Development Board, organised 32 gun-clubs. These gun-clubs killed in all 296 animals of which 27 were panthers, 196 pigs and 73 sambars. The total amount spent for supply of ammunitions and as rewards to Shikaris was Rs. 5,290.

(*h*) *Special Schemes.*—(*i*) Vegetable Development Scheme.—The extension of the area under vegetable was aimed at under the scheme. The additional area brought under vegetables was 1.100 acres against the target of 800 acres.

(*ii*) *Sweet Potato Scheme.*—The area brought under cultivation of sweet potatoes was 513 acres.

(*iii*) *Potato Extension Scheme*—During the year, 46,603 bags of seed potatoes and 55,534 mds. of potato manure mixture were supplied to the cultivators. Tagai loans for the purchase of seed potatoes and manures were also sanctioned to the cultivators, during the year under report.

D. *Agricultural Demonstration Centres*

In all, there were 15 Agricultural Demonstration Centres in the district, which continued to work. Demonstration of standing crops were held during the *kharif* and *rabi* seasons.

T. B. PAWAR,
District Agricultural Officer,
Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

1. District Trials.—Varietal trials of paddy, sesamum and groundnut will be carried out.

2. Grow More Foodcrops Campaign.—(*i*) Extension of improved seeds—This work will be carried out as per programme.

(*ii*) *Distribution of manures*—Groundnut cake, special manure mixture, sulphate of ammonia and superphosphate will be stocked as per targets and will be distributed to cultivators for various crops.

(*iii*) *Compost Development Scheme*—The target fixed under the rural and town compost schemes will be fulfilled and help in the form of petrol coupons for transport of town compost will be given.

(*iv*) *Construction and repairs to wells*—All possible assistance for inspection of this work will be afforded to the District Rural Development Board.

(*v*) *Insect pests and plant diseases*—The necessary equipment will be stocked for treatment of jowar seed against smut and paddy blast and blue beetle on paddy and help given to cultivators.

(*vi*) *Agricultural Shows.*—Necessary co-operation and help will be afforded to Show Committees in organising district and taluka shows successfully.

3. Vegetable Development Scheme.—(*i*) The target of increased acreage of vegetables and sweet potatoes for this district would be achieved. All the staff will be instructed to do their utmost in the extension of the vegetable cultivation in the interior areas.

(*ii*) *Potato Extension Scheme.*—Efforts will be made to reach the proposed target of 64,000 bags for the Poona district.

4. Agricultural Demonstration Centres.—Opening of new Agricultural Demonstration Centres will be effected with the approval of the District Rural Development Board and the Director of Ariculture.

T. B. PAWAR,
District Agricultural Officer,
Poona.

Appendix XVII

Summary of the Work done under the District Agricultural Officer, Satara North, Satara, for the year 1949-50

A. *Staff and Administration*

Shri S. V. Naikwadi continued to work as District Agricultural Officer, Satara, Satara North, during the period under report.

With the merger of Deccan States, the Satara district was split up into two districts, viz., Satara North and Satara South districts, with effect from the 1st August, 1949. Three talukas and one peta of the old district has been transferred to newly formed Satara South district. Additional area of the Phaltan State and 15 villages of the Bhor State and some other villages were merged in Satara North District. Satara North district comprises of 9 talukas and 2 petas, i. e., 11 units. In the new set up, 4 Agricultural Officers and 55 Agricultural Assistants (II and III grade), were on the establishment for the departmental activities in the district.

B. *Season*

The season, in general, was normal throughout the year. Rainfall was below average, but timely and well distributed, for both the *kharif* as well as the *rabi* seasons. All the crops were normal in yield, rainfall being in time for all the crops. At some places, due to non-receipt of late rains in October and November, 1949, *rabi* jowar crop was below normal resulting in less yield by about 25 per cent of the normal.

Rabi jowar crop was attacked by Chikta and karpa, and wheat by rust at some places, severity being mild.

Blight on *kharif* potato crop and some attack of blast on rice were reported. No adverse effect on yield was noticed.

C. *'Grow More Food' Campaign*

Work as detailed below was carried out in the district during the period under report.

(*a*) *Seed.*—A five-year scheme for the multiplication and distribution of improved strains of paddy in the Satara district:—

Name of the seed distributed	Quantity in Bengali Maunds.	Area covered. Acres.
Ambemohor 159	34·70	72

(*ii*) *Scheme No. 13 (21)—Multiplication and distribution of improved varieties of bajri, rabi jowar, wheat and gram.*

Name of the seed distributed.		Quantity in Bengali Maunds	Area covered. Acres
Akola Bajri.	II	830 50	8,305 0
Jowar M/35-1	II	115 00	1,150 0
	III	993·00	3,980 0
	IV	456 50	4,565 0
	Total ...	964·50	9,645 0
Wheat N-4	II	68·50	96 0
	III	28· 0	56 0
	Total ...	70·25	140 20
Chafa Gram.	II	40 0	96 0
	III	28 0	56 0
	Total ...	76·0	154 0

(*iii*) *Hot weather crop.*—No seed was distributed, only manure, viz. groundnut cake and manure mixture were supplied to cultivators.

(b) *Manures.*—The following quantities of manures were supplied to the cultivators.

(i) Name of manure	Quantity in tons.	Area covered. Acres.
Groundnut cake ...	3,568	17,840
Manure mixture ...	911	7,288
Sulphate of ammonia. ...	182	2,730

(ii) No. of compost pits dug.	No. of pits filled. Rural Compost.	Quantity compost produced tons.	Area covered. Acres.
12,500	4,379	2,190	876
	Town Compost	1,627·50	621

(c) *Irrigation.*—Propaganda for construction of new wells and repairs to old ones was carried out. Inspection for the purpose of subsidy of such wells was also carried out.

The Sub-Committee appointed by the District Rural Development Board, was helped in the proforma survey for selecting the sites for Irrigation Societies in the district. Of the 28 sites surveyed, 7 sites, i. e., 2 in Patan, 1 in Karad, 1 in Satara, 1 in Wai, 1 in Phaltan Taluka and 1 in Khandala Petha were given priorities for granting Government aid and subsidy. Work of five Societies is in progress.

(d) *Propaganda and publicity including shows.*—During the year, 218 meetings were held in the district by the District Staff. Besides, 254 Agricultural Demonstrations were arranged on the Agricultural Demonstration Centres and on the Farms of the progressive cultivators, demonstrating improvements in cultural practices, improved seeds and manures, control of pests and diseases, etc.

Stalls were also arranged at the District Agricultural and Cattle Show at Mhaswad.

Stalls were arranged at the Cattle Shows held at eight different places in the district.

Pamphlets received from the Director of Publicity, Bombay, were distributed to the cultivators.

(e) *Insect pests and plant diseases.*—During the year under report no pest damaging the crop was noticed. Bajri crop in the Phaltan taluka was attacked to a negligible extent by the grasshoppers, known as Kharpudi. Chikta and Karpa were observed on *rabi* jowar. Rust on wheat to some extent at the later stage was reported. No damage was effected.

(*f*) *Special Schemes.*—(*i*) *Vegetable Development Scheme.*—During the *kharif* season, 137 acres and 21 gunthas, and during the *rabi* season 239 acres and 32 gunthas were brought under vegetable cultivation as an additional area.

(*ii*) *Sweet Potato Extension Scheme.*—The additional area brought under sweet potato cultivation was as under:—

		Acres	Gunthas.
Kharif season	...	364	8
Rabi season	...	221	32

(*iii*) *Potato Extension Scheme.*—The quantity of seed potatoes supplied and the area covered were as under:—

		Quantity Bengal Maunds.	Area covered. Acres
Kharif season	...	6,661	666
Rabi season	...	910	91

D. *Agricultural Demonstration Centres*

Four Agricultural Demonstration Centres out of 20 were transferred to the Satara South district. Only 16 Agricultural Demonstration Centres were in operation, in this district.

284 demonstrations on these farms and on the farms of the progressive cultivators were arranged for educating the cultivators in cultural methods in agriculture, use of improved seeds and manures, control of pests and diseases, preparation of compost manure and improvement in the preparation of farmyard manure.

E. *Miscellaneous Activities*

Active help was given in carrying out the following special programmes arranged by the District Rural Development Board.

(*i*) Seven Social workers' Classes arranged in seven talukas, were attended and lectures and demonstrations were arranged at that time.

One Refreshers Class of the social workers was similarly attended.

(*ii*) *Tree Planting Week.*—Tree planting week was observed and 350 seedlings were supplied and got planted.

(*iii*) *Gram Sudhar Saptah.*—Gram Sudhar Saptah was observed and each Agricultural Assistant was given one village each day for the purpose. Work was carried out successfully.

(*iv*) *Compost Week.*—During the Gram Sudhar Saptah this was observed and at each village compost pits were got prepared.

(*v*) *Loranthus Week.*—Cutting of loranthus was observed and as many trees as possible were relieved of loranthus growth.

(*vi*) Officers' day at the Agricultural Demonstration Centre, Chinchner, in the Satara taluka was arranged. 15 Officers and 400 cultivators attended this day.

S. V. NAIKWADI,
District Agricultural Officer.
Satara North, Satara.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Distribution of improved seed —

Name of the seed.		Quantity to be distributed Bengal Maunds.
(*i*) Paddy	...	82½
(*ii*) Bajri	...	800
(*iii*) Rabi jowar	...	3,757
(*iv*) Wheat	...	240
(*v*) Gram	...	1,080

(2) Distribution of Manures:—

		Quantity.
(*i*) Groundnut oil cake	...	4,650 Tons
(*ii*) Manure Mixture	...	2,000 Tons
(*iii*) Sulphate of Ammonia	...	500 Tons

Digging of compost pits. 11,000.
Improvement farmyard manure pits in 400 villages.

(3) Extension of—

(I) Vegetable cultivation	...	300 Acres
(II) Sweet potato cultivation	...	200 Acres.

(4) Extension of dry farming methods and contour strip cultivation and demonstrations to be arranged at the Agricultural Demonstration Centres.

(5) Extension of cultivation of fibre crops:—

(*i*) Ambadi	...	500 Acres
(*ii*) Cotton	...	100 Acres

(6) District trials of improved strains:—

(*i*) Ambemohor Paddy	90 and 100	As per plan given
(*ii*) Sweet Potato strains	B-2. C. L. 44, and G. T. 6.	

(7) Establishment of new Agricultural Demonstration Centres—Two in each taluka or petha.

(8) Propaganda by holding demonstrations, meetings and shows.

(9) Miscellaneous:—

(*i*) Supply of insecticides and fungicides.

(*ii*) Technical help to cultivators.

(*iii*) Arranging Demonstrations and Shows in the district.

(*iv*) Help to Rural Development Board activities in training Classes, Lift Irrigation Scheme and Bandhara Schemes.

S. V. NAIKWADI,

District Agricultural Officer,
Satara North, Satara.

APPENDIX XVIII

Summary of the work done under the District Agricultural Officer, Satara South, Sangli, for the year 1949-50

A. *Staff and Administration*

During the year under report the post of the Agricultural Officer, Sangli, was converted into that of District Agricultural Officer, in the Bombay Agricultural Service Class II, and Shri P. S. Kulkarni took charge of the post on the 1st April, 1950.

The total strength of the staff consists of 2 Agricultural Officers, 32 Agricultural Assistants, 1 Head clerk and 6 clerks.

The Agricultural activities were carried out, though two Revenue sub-divisions, each of which was in charge of one Agricultural Officer. Each taluka or Mahal in each sub-division is further sub-divided into 5 circles in order to facilitate the spread of agricultural improvements.

This district was declared as an independent unit on the 1st August, 1949, and was in its organization stage. As such, the staff has been appointed in the course of the year. The office is very poorly furnished and with the increased activities, the staff needs to be increased still.

B. *Season*

Rainfall in the Satara South District amounted to an average of 14 inches and 97 cents. The rainfall was unevenly distributed throughout the district. The preparatory tillage was done as usual but due to absence of rains after sowing of the crops, the crops failed and resowing with *rabi* jowar had to be undertaken. This also did not prove successful as the lands were suitable for *kharif* crops only. In the circumstances, the crops which had grown up to the height of 2-3 feet had to be used as green fodder and the effect was that there was shortage of food and fodder. The rains during the *rabi* season helped the groundnut crop. Yield of wheat also was below expectation. The anna valuation of the crop was six annas only. On the whole, the season during the year under report proved unfavourable to crops.

There was shortage of fodder for cattle and food for human consumption. Water supply for drinking and for irrigation purposes was adequate.

Owing to the scarcity of food and fodder ruling prices of essential commodities had gone high. The condition of the cultivator was not satisfactory by economic point of view. The tractor ploughing for eradication of hariali was in progress. Iron ploughs were also used for the purpose. But in general, wooden ploughs and wooden drills are used in this district. All the tillage work is done with the help of bullocks. There was grasshopper trouble prevailing in places in the Miraj taluka. There was no cattle disease or human epidemic of a serious nature so as to affect the condition of different classes of the agricultural population. Control measures such as rationing of essential food commodities proved much useful.

Application of the Bombay Growth of Foodcrops Act and other measures taken by Government to ameliorate the condition was helpful, but, due to inadequate rains during the year, no remarkable progress was noticed.

Incidence of pests and diseases.—The principal insect pest was the Deccan wingless grasshopper affecting *kharif* jowar in the talukas of Miraj and Walawa. Control measures were adopted by dusting Gammexane. As the district was in its formation stage, equipment was not available to the fullest extent to completely control this pest. In parts of Khanapur, Walawa and other areas jowar crop was affected by Sugary diseases affecting the yield of grain and fodder adversely. Wheat N-4 suffered from severe attack of rust in parts of Walawa.

C. *"Grow More Food" Campaign*

(*a*) *Improved Seed Scheme.*—P. W. R. Scheme No. 13 was in operation. During the year under report, seeds were distributed as under:—

Name of the seed.	Quantity B. Mds.	Area covered Acres.
Akola bajari	13	210
Jowar M-35-1	1,045	13,230
Chaffa gram	50	67
Wheat N-4	27	36

(*b*) *Manures.*—(1) The following quantities of manures were distributed during the year under report.

	Quantity t ns	Area covered Acres.
Groundnut cake for foodcrops	970	4,850
Manure mixture	245	1,960
Sulphate of ammonia	110	2,200
Super phosphate	7	140

These manures were applied to paddy, jowar, khapli and sugarcane crops. 1,353 tons of groundnut cake were distributed for feeding cattle.

(2) Rural compost.—During the year under report, 1,740 pits were dug and filled in. The total quantity of ripe compost obtained was 4,350 tons. Almost all the compost was applied to lands for foodcrops, covering an area of approximately 4,000 acres.

(3) Town Compost.—During the year under report, 7 Municipalities prepared compost. Gram Panchayats did not join in the scheme. The total quantity of compost obtained from the town waste was 2,690 tons. This ripe compost was used mostly for applying to foodcrops, to cover an area of approximately 1,000 acres.

(*c*) *Irrigation wells.*—The progress of work under this scheme was as under:—

		Nos
New wells sunk	...	138
Old wells repaired	...	279

(*d*) *Propaganda and publicity including shows.*—

(1) As usual, intensive propaganda was carried out for increasing the food production by adopting improved methods advocated by the Department, with a view to creating a healthy spirit of competition amongst the cultivators in stepping up per acre yield of staple crops. Government set aside an

amount of Rs. 150 for each taluka for awarding prizes to the cultivators. The decision of awarding prizes was announced well in advance through the Agricultural Assistants and special hand bills were issued for the purpose. In all 11 *kharif* jowar growers competed. It has been decided that no prizes for the last year's competition should be given as the scheme was not implemented in the district on the lines laid down in the Government Resolution.

(2) With a view to convincing the cultivators about the advantages and practicability of the agricultural improvements, 25 crop demonstrations were arranged.

In addition to these, large number of occulor demonstrations were held on the following items:—

(*i*) Filling compost pits.

(*ii*) Treating jowar seed with sulphur dust against grain smut.

(*iii*) Dusting gammexane to control grasshoppers.

(*iv*) Improvement of farmyard manure.

(3) One District Vegetable Show was organized at Sangli on the 16th October, 1949. In all 100 samples of foodgrains and 600 of vegetables were exhibited. One District Agricultural and Industrial Exhibition was held at Sangli in May, 1950, wherein all the departmental activities were demonstrated to the visitors with actual samples of foodgrains, vegetables, fruits, plans and charts. In the vegetable show numerous cultivators showed keen interest in the competition. 44 exhibits won prizes. It was estimated that about 30 to 35 thousand people visited these shows.

Besides these, at the time of important fairs, 22 demonstrations were arranged to carry home to the minds of the leading agricultural public the importance of improved agricultural methods and facilities granted by Government to step up food production. Leaflets on composting vegetable wastes, control of grain smut on jowar and control of Deccan wingless grasshoppers by the use of Gammexane were distributed to the cultivators.

(*e*) *Insect pests and plant diseases.*—

(*i*) Grasshopper attack was severe on an area of 5,000 acres and preventive measures were adopted on an area of 1,000 acres and that area was treated with Gammexane.

(*ii*) Jowar seed sufficient to cover 14,000 acres was treated with sulphur dust against grain smut of jowar.

(f) Special schemes.—

(i) *Vegetable Development Scheme.*—The extension of vegetable area has exceeded the target figure of 200 acres allotted to this district by 42 acres.

(ii) *Sweet potato scheme.*—The target fixed was 660 acres. The actual area planted was 285 acres.

D. *Agricultural Demonstration Centres*

In all 4 Agricultural Demonstration Centres were operating in this district, when it was formed. One of the centres completed its 5 years' plan and closed to function. New centres for the merged areas are to be opened.

E. *Lift Irrigation Scheme*

One lift irrigation plant on the Krishna river commenced work. It was helpful for growing more foodcrops including paddy.

F. *Miscellaneous activities*

During the year under report the district was in the organization stage from the point of agricultural activities. The District Agricultural Officer worked as joint Secretary of the District Rural Development Board and was on various committees for developmental activities and social training.

P. S. KULKARNI,
District Agricultural Officer,
Satara South, Sangli.

PROGRAMME OF WORK FOR THE YEAR 1950-51

1. (a) *Multiplication and distribution of improved seeds.*—Seeds of Akola bajari, paddy, *rabi* jowar M-35-1, wheat N-4 and chaffa gram to be supplied to cultivators.

Improved seeds to be multiplied as per target fixed.

(b) *Manures.*—

(i) Groundnut cake manure, manure mixture, sulphate of ammonia and Super phosphate to be stocked and distributed as per targets.

(ii) Compost manure in rural areas and urban areas to be prepared and distributed for foodcrops as per plan. Besides, trench latrines and carrion compost yards will be extended.

(c) *Irrigation.*—

(i) Lift Irrigation scheme at Padmale will continue.

(*ii*) Scheme for construction of new wells and repairs to old ones will continue as per plan.

(*d*) *Pests and diseases.*—

(*i*) *Smut.*—Treatment of jowar seed will sulphur dust to cover the whole area of this district for completely preventing smut.

(*ii*) *Wingless Grasshopper Control Scheme.*—

Dusting of gammexane for the destruction of this pest and to save jowar crop food and fodder.

Gammexane will be supplied as per target and if required more will be ordered for eradicating this pest. One power duster will be put into operation at that time.

(*e*) *Special Schemes.*—

Extension of vegetables, potatoes and sweet potatoes to be achieved as per targets.

2. Agricultural Demonstration Centres.—

Working of 3 Agricultural Demonstration Centres will continue and 9 centres will be opened in this year, so as to keep 2 demonstration centres for each taluka.

3. Propaganda, shows and demonstrations.—

One district vegetable show, one agricultural and industrial show, taluka shows, crop and other demonstrations like improvement of farmyard manure, compost making, preparation and application of insecticides and fungicides, etc., to be held in addition to the propaganda. Meetings will be held and articles published.

P. S. KULKARNI,
District Agricultural Officer,
Satara South, Sangli.

Appendix XIX

Summary of the Work done under the District Agricultural Officer, Ahmednagar, for the year 1949-50

A. *Staff and Administration*

Shri P. V. Wagle continued to hold charge of the post of District Agricultural Officer till the 10th October, 1949. He handed over charge of the post to Shri P. R. Patil on the 10th October, 1949, after office hours, and Shri Patil continued to hold charge of the post thereafter. Shri A. H. Kusnale continued to hold charge of the post of Assistant District Agricultural Officer till the end of the year. The posts of 4 Agricultural Officers were continued, with a transfer of the incumbent Shri P. R. Inamdar, who handed over his charge to Shri P. D. Jadhav. During the year under report, 24 and 41 Agricultural Assistants in the II and III grade, respectively, were working in the district to carry on the work in connexion with 'Grow More Food' Campaign, purchase and distribution of improved seeds, manures, fertilizers, extending the area under foodcrops and vegetables, cultivation of waste lands, and giving technical help and guidance to the cultivators in agricultural matters.

B. *Season*

The 1949-50 *kharif* and *rabi* season was too moderate and disappointing. The anti-monsoon showers were not favourable throughout the district. Monsoon broke out in time, but the monsoon showers were not sufficient for completing sowing of the *kharif* crops. Few scattered rains were received in the latter half of June and first part of July, and with these scanty rains, the sowing of bajri was continued and was over by the end of July. There was a long break in the rains for about 4-5 weeks and germinating young seedlings showed signs of withering. The condition was, however, much improved by the rains received in the second fortnight of August. These rains helped for the sowing of *rabi* crops in opportune time. But, torrential rains in the latter half of September were received and these damaged the standing matured *kharif* crops. The sowing of *rabi* crops was prolonged and, at some places, *rabi* jowar, which was already sown in the low lying areas, had to be grubbed up and the area had to be re-sown with gram. The sowing of *rabi* crops was over by the end of November. Due to the heavy rains, the soil was packed and there was no proper aeration in the soil. There were practically no rains thereafter

and the standing *rabi* crops, particularly, *rabi* jowar on lighter and medium types of soils suffered much.

Cold wave passed over the district on the 9th and the 10th February, 1950, but it was not so severe. It damaged the standing crops to the extent of 30 to 40 per cent of the total area under such standing crops.

There was attack of rust on wheat in scattered areas and control measures of dusting sulphur over the crop as a preventive measure were advocated. The damage was negligible.

The yields of both *kharif* and *rabi* crops during the year were below the normal giving an alarm for the scarcity conditions, especially in the talukas of Ahmednagar, Shrigonda, Karjat, Pathardi, Sangamner, and Parner.

Thus it can be concluded that the season under report was too moderate and disappointing.

C. *'Grow More Food' Campaign*

(*a*) *Seeds.*—(*i*) The schemes for distribution of improved seeds of Akola bajri, jowar M-35/1, Jaya wheat, Vijaya wheat, Niphad-4 wheat and Chafa gram were in operation in the district.

Akola bajri seed was purchased to the extent of 9,947 mds. for distribution in the district and also for supply to other Deccan districts in this State.

The quantities of 1,766 mds. of Akola bajri, 9,856 mds. of Jowar M-35-1, 460 mds. of wheat and 369 mds. of Chafa gram were distributed for covering an area of 17,660, 98,565, 773 and 940 acres, respectively.

(*ii*) *Seeds supplied to famine and scarcity areas.*—Due to unsatisfactory season of the previous year, it was necessary to make provision of various seeds to meet emergency demand. Hence, various seeds of foodcrops were selected from the Revenue godowns by the Agricultural Department and the distribution of these seeds was done by the Revenue Department. Wheat seed was imported to the extent of 11,409 mds. from Sindh and Punjab and 5,093 mds. from the Nasik district. The distribution of seed was done by Revenue Department. Large quantities of bajri and jowar seeds were sent to outside districts for seed purposes.

(*iii*) *Hot Weather Crops Campaign.*—160 mds. of maize seed was distributed for covering an area of 650 acres. This was mainly used for fodder rather than for grain purpose.

(b) *Manures.*—(1) Groundnut cake—There was an allotment of 6,500 tons of groundnut cake for distribution to various foodcrops. The quantities distributed were 367 tons for bajri, 1,106 tons for paddy and hot weather crops, 2,140 tons for irrigated jowar and 986 tons for irrigated wheat sufficient for 5,138, 6,210, 12,840 and 5,910 acres, respectively. In addition, 4,464 tons of groundnut cake was distributed for cattle feeding against the target of 5,000 tons.

(2) Manure mixture—A total quantity of 521 tons of manure mixture was distributed for paddy and irrigated foodcrops at the subsidised rate of Rs. 196 per ton and for fruits and vegetables at the full cost of Rs. 264 per ton, as against the target of 799 tons.

(3) Sulphate of ammonia—A total quantity of 181 tons of sulphate of ammonia was distributed for paddy and vegetables covering a total area of 2,715 acres.

(4) Rural compost—The target fixed for digging and filling compost pits was 16,000. 9,674 pits were dug, and of these, 7,834 pits were filled. In addition to these, 1,293 pits were refilled and 2 173 pits, which were dug during the previous year and kept vacant, were also got filled. The total quantity of compost available for manuring foodcrops during the year was 14,200 tons sufficient for covering an area of 2,840 acres.

(5) Town compost—Five municipalities had undertaken the work of preparing town compost. The total quantity of ripe compost produced by these municipalities was 12,932 tons as against the target of 14,000 tons, and 12,596 tons of this compost were utilised for manuring dry and irrigated foodcrops, covering a total area of 2,520 acres.

(6) Improvement of farmyard manure—The work of digging and filling farmyard manure by systematic method was started in 458 villages, but only the work could be taken up in 150 villages. There was no proper response for this work from the cultivators.

(c) *Irrigation.*—(1) Wells—The target fixed for construction of new wells and repairs to old ones was 600 and 150 wells, respectively. The District Rural Development Board sanctioned tagai of Rs. 5,69,030 for 675 tagai cases and paid subsidy of Rs. 37,850 for 148 new wells constructed and for 117 old wells repaired.

(2) Construction of *Kaccha* bandharas—An amount of Rs. 16,538 was paid as subsidy for construction and repairs to *kaccha* bandharas for 120 cases.

(*d*) *Propaganda and publicity, including shows.*—Intensive and extensive propaganda was made and, in all, 873 meetings were held and technical advise and guidance were given to the cultivators.

90 Shows and 198 demonstrations were held to bring home to the cultivators the importance and advantage of improved seeds, manures, fertilizers, etc.

(*e*) *Insect pests and plant diseases.*—There was no trouble of any pest or disease of importance, except rust on wheat in scattered areas in a mild form.

Sulphur dust was distributed free of cost for treating jowar seed against jowar smut. The quantity of sulphur dust distributed was 10,000 lbs. for covering an area of 3,20,000 acres.

(*f*) *Special Schemes.*—(1) Vegetable Schemes—An area of 612 acres was extended under vegetable cultivation against the target of 600 acres.

(2) Sweet potatoes—The target for extending the area under sweet potato for hot weather, *kharif* and *rabi* seasons was 150, 500, and 500 acres respectively, and the total area extended was 788 acres.

(3) Potato—An area of 1,333 acres was to be covered under potato during the *kharif* and *rabi* seasons and the actual area covered was 790 acres.

D. *Agricultural Demonstration Centres*

In all, 13 centres were established and there were no changes during the year.

E. *Well Irrigation Centres*

The well irrigation centre was closed from the 30th June, 1949.

F. *Miscellaneous Activities*

The District Agricultural Officer attended the District Rural Development Board and Canal Advisory meetings held from time to time and gave technical help and guidance. Four training classes for the social workers were organised under the auspicious of the District Rural Development Board and lectures were given by the District Agricultural Officers and the Agricultural Officers and all possible help was given in organising the classes.

86 classes were held for training in the technique of preparation of farmyard manure for the Primary School Teachers, Sanitary Squads, Home Guards, etc., by the Agricultural Officers and the Agricultural Assistants.

All staff participated in the Gram Sudhar Saptaha and Tree Planting Week.

P. R. PATIL,
District Agricultural Officer,
Ahmednagar.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(*a*) *'Grow More Food' Campaign.*—(1) Purchase and distribution of improved seeds of Akola bajri, jowar, M-35-1, wheat Niphad-4, and Chafa gram.

(2) Manure-distribution of groundnut cake for foodcrops and cattle feeding, cake meal for potato, manure mixture and superphosphate for foodcrops and vegetables, sweet potato manure mixture for vegetables and sulphate of ammonia to all crops.

(3) Rural Compost—Digging and filling compost pits with farm waste.

(4) Preparation of farmyard manure by a systematic method.

(5) Preparation of compost from town refuse and night soil by all the municipalities in the district.

(6) Irrigation—(*i*) Construction of new wells and repairs to old ones by granting tagai and subsidy, (*ii*) Construction and repairs to *kacha* bandharas.

(7) Extension of area under vegetables, sweet potato and potato.

(8) Plant protection—Control measures for the appearance of pests and diseases and giving technical help and advise.

(*b*) *Agricultural Demonstration Centres.*—Giving technical guidance to the owners of the centres in farm operations and for adoption of improved methods, arranging demonstrations and shows, etc.

(*c*) District trials of improved strains.

(*d*) Crop Cutting Tests.

(*e*) Propaganda, and publicity including arranging shows and demonstrations.

P. R. PATIL,
District Agricultural Officer,
Ahmednagar.

Appendix XX

Summary of the work done under the District Agricultural Officer, Nasik, for the year 1949-50

A. *Staff and Administration*

This district comprises of 12 talukas and one mahal and has been divided into 4 sub-divisions, which are in charge of Agricultural Officers, and hence each Agricultural Officer has got 3 talukas in his charge. Each taluka is split up into 5 circles and each circle is in charge of an Agricultural Assistant. Shri G. V. Hardikar continued as District Agricultural Officer up to December, 1949 and for the rest of the period Shri G. K. Phadtare worked as District Agricultural Officer. One Assistant District Agricultural Officer has been given for assisting the District Agricultural Officer to carry on the daily routine of the office.

B. *Season*

The beginning of monsoon was late. But, in Maval tract (Igatpuri, Peint, Surgana, etc.,) rain was in time and it has facilitated the timely operations of paddy. Transplanting, etc., was done in time. Crops of bajri and paddy, which were ready for harvest, were damaged due to heavy rains received in the 3rd week of October resulting in lower yield and poor quality grains. *Rabi* sowing was delayed at places, and where sowing was done, resowing was forced to resort.

C. *"Grow More Food" Campaign*

(1) Seed Schemes:—(*i*) *Akola bajri.*—1,875 B. Mds. of seed was the target for the year under report and this quantity was purchased from the Ahmednagar district and was distributed to cover the target area of 18,750 acres in one compact block consisting of 20 villages in the Sinnar taluka. But unfortunately, due to scarcity of rainfall in the beginning and heavy rainfall at the time of harvest, the whole area was damaged and thus the selected compact block failed.

(*ii*) *Rabi jowar* (*M-35-1*).—The target of this crop was 1,684 B. mds. of seed of which 1,437 B. mds. of seed was purchased and distributed and the area covered was 14,370.

(*iii*) *Wheat N-81* (*Dry*).—528¾ Mds. of seed was purchased and distributed against the target of 420 mds. The area covered was 1,049 acres and 20 gunthas.

(*iv*) *Wheat N-4 (Irrigated).*—There was no difficulty to distribute seed according to the target figures of 240 mds. but on the contrary, it was exceeded by 93½ Mds. The area covered was 667 acres.

(*v*) *Gram (Chafa).*—775¾ mds. of this seed was distributed against the target of 930 Mds. The area covered was 1,551 acres and 20 gunthas. All the improved seeds were purchased from the registered seed growers, except Akola bajri.

(2) Manures:—

(*a*) *Groundnut cake.*—5,000 tons of groundnut cake was the target of distribution for applying as manure for foodcrops. 4,083 tons of cake was supplied and the area covered was 20,415 acres.

(*b*) *Manure mixture.*—1,378 tons of manure mixture was distributed against the target figure of 1,600 tons and the area covered was 11,026 acres.

(*c*) *Sulphate of ammonia.*—587 tons of sulphate of ammonia was given to the cultivators for applying as manure and the area covered was 7,044 acres.

(*d*) *Super phosphate.*—70¼ tons of super phosphate was distributed and an area of 841 acres was covered by this quantity.

(*e*) *Potato manure.*—365½ tons of potato manure was distributed and the area covered was 1,462 acres.

(*f*) *Compost:*—(*a*) *Rural compost.*—The target of 25,000 tons of compost was surpassed by 697 tons and the area covered was 5,039 acres which was also more than the target of 5,000 acres by 39 acres.

(*b*) *Town compost.*—Here also the target was exceeded by 1,254 tons of compost and thereby the area was also naturally increased, which was 2,191 acres.

(*g*) *Utilization of cattle urine, etc.*—1,000 tons of this manure was brought from Bombay and the area covered was 260 acres. It was not possible to bring more of this manure due to non-availability of waggons, though the demand was there, and hence the target could not be achieved.

(3) Irrigation Scheme.—The target of construction of new wells, viz. 900 wells and repairs to old wells, viz. 100 wells could not be achieved. However, 559 and 45 wells were constructed and repaired, respectively and the area brought under the scheme was 2,295 acres.

(4) Propaganda and publicity, including shows.—About 250 meetings were arranged throughout the district to advocate the departmental activities during the year under report. Three shows were also arranged. Four publications were issued.

(5) Insect pests and plant diseases.—946 lbs. of sulphur was distributed free for jowar smut, 20 tons of gammexane was stored for the wheat crop and out of this, 3¼ tons were supplied for checking the attack grasshoppers on bajri and insects on vegetable, etc. This insecticide is being popularised amongst the cultivators. Precautionry measures were advocated to grapevine cultivators to guard against the cold and diseases.

(6) Special Schemes.—(*i*) *Vegetable Scheme.*—The area was much increased and there was no necessity to advocate for its extension as it always extends with the demand of the Bombay market as all the quantity is generally sent to Bombay.

(*ii*) *Sweet potato.*—There was very little scope for its extension. However, 509½ acres of its plantation was made during the year under report.

(*iii*) *Potato cultivation.*—In the *kharif* season 225 bags of sweet potatoes and in the *rabi* season 6,033 bags of sweet potatoes were supplied to the cultivators as against the target of 1,000 and 16,000 bags respectively. The *kharif* seed received was very bad and it was useless for sowing. It was sold by auction. *Rabi* seed was brought from Simla and was very good. The area covered by this crop in the *rabi* season was about 1,448 acres.

D. *Agricultural Demonstration Centres*

There were 12 Agricultural Demonstration Centres in this district as shown below:—

Name of centre		Taluka
1. Nasik	...	Mhasrul
2. Sinnar	...	Sinnar
3. Igatpuri	...	Ghoti
4. Niphad	...	Kothure
5. Yeola	...	Erandgaon
6. Chandor	...	Wadalibhoi
7. Kalwan	...	Manur
8. Peint	...	Harsul
9. Dindori	...	Vanarwadi
10. Nandgaon	...	Miswal
11. Malegaon	...	Mungase
12. Baglan	...	Virgaon

There was no change under this item during the year under report. These centres are useful for demonstrating all improvements of agriculture.

E. *Miscellaneous Activities*

(*a*) As Joint Secretary of District Rural Development Board, the meetings of Board were attended.

(*b*) Fruit cultivation was on an increasing scale. The cultivation of grapes is restricted to Nasik and Niphad talukas. The acreage under the same is nearly 1,000. Chikoo, lemons and papaya are being cultivated on a large scale. Fruit plants were supplied at reasonable rates from the nursaries at Kundewadi in the Niphad taluka and Puntamba in the Nagar district.

(*c*) As a result of propaganda, many cultivators through out the district have put bunds in their fields to preserve the soil fertility.

(*d*) The demand for tractor ploughing and bull-dozer for levelling is increasing day by day. The service of the tractors and bull-dozer falls short to some extent. The acreage ploughed by tractor was 1,263 acres and 24 gunthas. The work of bull-dozer was for 621½ hours.

The total cultivation of Jarila cotton in this district is 3,800 acres which is restricted to the talukas of Malegaon, Satana and Baglan. The Department supplied seed to cover an area of 594 acres 14 gunthas under different stages.

G. K. PHADTARE,
District Agricultural Officer
Nasik.

PROGRAMME OF WORK FOR THE YEAR 1950-51

I. *Seed Schemes.*—The following seeds will be distributed.

Kind of seed.	Quantity and stages. in B. Md.				Areas to be covered in acres.			
	I.	III.	IV.	General.	II.	III.	IV.	General.
Bajri (Akola) ...	3,750	...	...	...	37,500	...	...	...
Rabi Jowar ...	4	80	800	800	40	800	8,000	8,000
Wheat N-4 ...	40	200	...	...	40	200	2,000	...
Gram ...	30	150	750	3,750	60	300	1,500	7,500

II. *Manures.*—The following quantities of manures will be supplied.

Kind of manure.	Target of quantity to be supplied. tons.	Area to be covered. Acres.
(*a*) Groundnut ..	7,000	35,000
(*b*) Manure mixture (*kharif*) ...	4,000	32,000
(*c*) Manure mixture (*rabi*) ...	3,000	24,000
(*d*) Groundnut meal ...	100	...
(*e*) *Rural Compost* ...	10,000 (pits) to be dug and filled.	5,000
(*f*) *Urgab Compost* ...	19,000	3,800

III. *Irrigation Scheme—*

No. of wells to be constructed or repaired.	Area to be covered.
600 (New wells) 100 (repairs to old wells)	2,600

IV. *Plant protection.*—Sulphur dust and Gammexane will be supplied to the cultivators as under:—

Sulphur	...	9,646 lbs.
Gammexane	...	20 tons

V. *Scheme for extension of other crops:—*

	Area to be covered Acres.
(*a*) Sweet potato: *kharif*	100
Sweet potato: *rabi*	100
(*b*) Vegetable Development Scheme... ...	500 (No target fixed),
(*c*) Scheme for utilization of cattle dung manure. 5,000 (tons)	1,000
(*d*) Cultivation of potato : *kharif* 2,000 maunds Cultivation of potato : *rabi* 26,000 maunds.	3,000

VI. *No. of villages selected for improvement of F. Y. Manure.*

No. of villages.	No. of pits to be dug.	Area to be covered acres.
400	28,800	14,400

G. K. PHADTARE,
District Agricultural Officer,
Nasik.

Appendix XXI

Summary of the Work done under the District Agricultural Officer, East Khandesh, Jalgaon, for the year 1949-50

A. *Staff and Administration*

Shri P. R. Patil held charge of the District Agricultural Officer till the 4th October 1949, when he was transferred to Ahmednagar district, and Shri D. M. Kulkarni held charge of the post for the remaining period of the year. The District Agricultural Officer was assisted by the following staff scattered in the district:—

One Assistant District Agricultural Officer attached to office, three Agricultural Officers, in charge of the Revenue Subdivisions, 26 Agricultural Assistants (II grade) and 40 Agricultural Assistants (III Grade).

B. *Season*

Though the brakeout of the monsoon was normal with the commencement of precipitation during the 1st week of June, 1949, further distribution of rainfall was very uneven and discouraging. The sowing of *kharif* crops was commenced at the right moment, i.e., in the 2nd week of June. The development of all crops was satisfactory, except groundnut, which received a set-back from aphis attack in the month of August. The torencial rains received during the 3rd week of September had damaged the crops of bajari, udid, and cotton to a great deal. The heavy abnormal rains received in the month of September resulted in inaccessibility of soil and consequently delayed sowing of *rabi* crops by about a month. The *rabi* crops, however, germinated and developed fairly well. Occurrence of rust on wheat crop was negligible.

C. *'Grow More Food' Campaign*

During the year under report the important activities mainly pertain to 'Grow More Food' Campaign. The annual deficit of the foodgrain in the district was estimated at 30,000 tons and all-out efforts were made to achieve the target fixed under various 'Grow More Food' schemes so as to make up this deficit. A short account of the main 'Grow More Food' schemes, which were operating during the year, is detailed below:—

(*a*) *Seeds.*—During kharif season, 600 maunds of Akola bajri was sown in compact blocks in various villages covering an area of 6,000 acres under the strain. As all the bajri crop in

the district was spoiled by untimely rains, the produce from the compact blocks could not be secured for further distribution according to the plan. Similarly, 436 maunds of improved seed of Gulab wheat and 96½ maunds of Niphad-4 wheat were supplied to the registered seed growers for multiplication. The area covered under both these strains was 872 and 97 acres, respectively. Besides, 109 maunds of general seed of Kalikusal paddy was distributed to the needy cultivators. The additional yield obtained from the supply of all the improved strains of seeds during the year was estimated at 375 tons.

(*b*) *Manure.*—(*i*) Groundnut cake and Manure Mixture—Groundnut cake and manure mixture were distributed to the cultivators for manuring foodcrops as detailed below:—

Manure.	Name of crop.	Quantity supplied Tons.	Area covered in Acres.	Additional yield obtained.
Groundnut cake ...	Kharif jowar and Bajri.	5,607	72,891	2,663
	Wheat ...	1,180	7,080	758
Manure mixture ...	Paddy ...	1,787	14,296	1,532
	Wheat ...	1,464	10,980	1,176
	Total ...			6,129

Besides the distribution of manures for foodcrops, 600 tons of manure mixture and 642 tons of sulphate of ammonia were distributed for manuring vegetables and banana.

(*ii*) *Compost making in rural areas.*—The scheme for making compost in rural areas was operated in the district very successfully with the whole hearted co-operation from the public as well as from other Government Departments so much so that 11,981 new pits were dug, of which 10,766 could be filled in and 9,860 old emptied pits were refilled during the year under report and additional yield in view of this achievement was estimated at 1,005 tons.

(*iii*) *Improvement of farmyard Manure.*—The scheme for preparing farmyard manure by improved methods was launched in the district from the 1st July, 1949. Periodical classes were held throughout the district for training the cultivators, social workers, secretaries of Gram Panchayats, Sanitary squads staff of the Taluka Development Associations and Assistant Registrar, Co-operative Societies, in the methods

of preparing farmyard manure. In all 14,692 pits were dug and filled in under the scheme so as to produce, 7,346 tons of farmyard manure. An additional yield obtained by implimenting this scheme during the year was estimated at 715 tons.

(*iv*) *Town Compost Scheme.*—All the 13 Municipalities in this district prepared 12,863 tons of ripe compost against the target of 12,967 tons. An area of 2,572 acres was estimated to have been covered under for application of this ripe compost to foodcrops and the additional yield was estimated at 271 tons.

(*c*) *Irrigation.*—During the year under report, 555 new wells were constructed and 131 old wells were repaired. 3,482 acres under foodcrops were irrigated so as to increase the food production by 443 tons.

(*d*) *Propaganda and Publicity.*—Propaganda, mainly pertaining to 'Grow More Food' drive, was carried on by arranging 3,303 meetings of the cultivators throughout the district, which were attended by 1,51,650 cultivators. Besides 18 articles were published in the local weekly papers and in the form of pamphlets on various aspects. Three Agricultural and Cattle Shows were also arranged.

(*e*) *Insects, pests and plant disease.*—3,342 lb. of sulphur dust was distributed gratis to the cultivators for treating jowar seed against smut. The incidence of wheat rust was negligible.

(*f*) *Special Schemes.*—Vegetable development and Sweet *potato extension schemes.*—Area extended under vegetable and sweet potato crops was 713 and 247 acres, respectively.

D. *Agricultural Demonsrtation Centres*

16 Agricultural Demonstrations Centres continued to work during the year. 96 Demonstrations were held at these centres during the year, which were attended by 5,000 cultivators.

E. *Miscellaneous activities*

(1) Village workers training Class.—Two classes of social workers were organised during the year in the Jamner and Chopada Talukas.

(2) Tree Planting.—The district staff celebrated the tree planting week by supplying and planting 34,802 trees.

(3) Selection of seeds of *kharif* and *rabi* crops was made from the Levy purchased stocks in the Revenue godowns for distributing to the cultivators.

(4) *Scheme for conversion of night soil into manure.*—The work of converting night soil into manure was started in 4 villages according to the scheme.

(5) A quantity of 13,181 tons of groundnut cake was lifted from various oil mills in the district and transport to deficit districts was effected according to the programme.

D. M. KULKARNI,
District Agricultural Officer.
East Khandesh, Jalgaon.

PROGRAMME OF WORK FOR THE YEAR 1950-51

The targets of Grow More Food Schemes and other schemes in East Khandesh District, for the year 1950-51 are as under:—

Name of the Scheme.	Target of quantity to be distributed.	Area to be covered in acres.	Additional yield estimated from Column No 3.
1. *Seed Scheme.*—	Maunds.		Maunds.
Multiplication and distribution of improved seeds.			
(*a*) Akola Bajari. ...	1,200	12,000	214
Do. (Natural spread). ...	...	12,000	214
(*b*) Wheat Niphad-4 ...	20	1,037	28
II Stage ...	20		
III Stage ...	183		
IV Stage ...	572		
Gulab ...	132		
	907		
Do. (Natural Spread). ...	...	5,000	134
(*c*) Jowar-M-35-1. ...	20	200	5
2. *Manure Schemes.*—			
(*a*) Application of Groundnut cake manure to food-crops.	Tons.		
(1) Kharif Jowar and Bajari.	5,100	66,300	2,368
(*b*) Distribution of manure for food-crops.			
(1) Paddy ...	2,280	14,240	1,954
(2) Wheat ..	2,000	15,000	1,607
(*c*) Compost making in Rural area, pits to be dug and filled.	15,000 (new) 15,000 (Refilling.)	15,000	1,607
(*d*) Composting town refuse by Municipalities.	15,000	3,000	321
(*e*) Improvement in the quality and quantity of Farmyard manure.	33,600	16,800	1,800
3. *Irrigation Schemes.*—			
Constructing new wells ...	600	3,200	678
Repairing old wells ..	300	600	
4. *Extension of cultivation of other crops.*			
(*a*) Vegetables ..	...	300	900
(*b*) Sweet potato ...	...	100	300
		Total...	12,500

Other Schemes

	Acres.
(1) Extending area under fibre crops:—	
(*a*) *Cotton.*—	
(*i*) By mixed cropping in groundnut crop	8,000
(*ii*) By distributing sulphate of ammonia at concessional rate.	30,000
(*b*) Ambadi	500

D. M. KULKARNI,
District Agricultural Officer,
East Khandesh, Jalgaon.

APPENDIX XXII

Summary of the Work done under the District Agricultural Officer, West Khandesh, Dhulia, for the year 1949-50

A. *Staff and Administration*

Shri K. G. Kolhatkar, B.Ag., continued to be the District Agricultural Officer, West Khandesh, Dhulia. Shri R. D. Gaitonde continued to be the Assistant District Agricultural Officer, West Khandesh, Dhulia. There are 3 Agricultural Officers and 58 Agricultural Assistants in this district.

B. *Season*

The monsoon started in June and the season on the whole was normal. Rain received at the time of harvesting of *kharif* crops spoiled the grain and delayed the sowing of *rabi* jowar. The *rabi* wheat gave a good crop. Irrigated wheat was excellent. Due to the late rain, the *rabi* jowar was sown late and did not give good yields. Gram crop was normal. There were no pests and diseases, except rust on irrigated wheat, which was controlled by dusting sulphur dust in two villages.

C. *'Grow More Food' Schemes*

(*a*) *Seeds.*—(*i*) Schemes for the multiplication and distribution of improved seeds, like Akola bajri, Maldandi 35-1, Motiya wheat, irrigated wheat, Niphad 4 and Chafa gram were in progress during the period under report.

(1) Akola bajri—750 B. mds. of II stage Akola bajri seed was distributed covering an area of 7,500 acres and giving an additional production of 7,750 mds.

(2) Maldandi 35-1:—3,803 B. mds. of jowar seed was distributed covering an area of 38,030 acres. The additional yield was 19,015 B. mds.

(3) Motiya wheat—153 mds. and 7 lbs. of Motiya wheatseed was distributed over an area of 306 acres. The additional production obtained was 230 mds.

(4) Wheat Niphad-4—Against the target of 90 mds., 265½ mds. of this seed was purchased and distributed, covering an area of 265½ acres which gave an additional yield of 199 mds.

(5) Chafa gram—Against the target of 775 Mds., 761 Mds. of this seed was purchased and distributed over an area of 1,522 acres, which gave an additional production of 1,141 Mds. and 40 lbs.

1,99,953 Mds. of various seeds were selected from the revenue godowns for seed purposes.

(*ii*) No seeds were distributed for famine or scarcity areas.

(*iii*) There was no hot weather campaign.

(*b*) *Manures.*—(*i*) Groundnut cake—A quantity of 3,300 tons of groundnut cake was stored and distributed over an area of 19,800 acres giving an additional productoin of 59,400 Mds.

(*ii*) *Manure mixture.*—Of the target of 1,939 mds., a quantity of 1,827 tons of manure mixture was distributed over an area of 10,962 acres giving an additional production of 32,886 Mds. The complete target could not be achieved as the *rabi* manure mixture was received late.

(*iii*) *Sulphate of ammonia*—A quantity of 175 tons of sulphate of ammonia was distributed, covering an area of 2,635 acres and the additional production was 2,635 mds.

(*iv*) *Superphosphate*—11 tons and 16 Cwts. of superphosphate was distributed for fruit trees.

(*v*) *Rural compost*—Out of the target of 10,000 pits to be dug and filled, 10,227 pits were dug and 8,522 pits were filled during this year, covering an area of 8,522 acres, which gave an additional production of 8,522 Mds.

(*vi*) *Farmyard manure*—16,737 farmyard manure pits were dug and filled in 446 villages against the target of 12,000 pits. This has resulted in an additional production of 25,500 mds.

(*vii*) *Town compost*—The target of town compost is 5,700 tons, of which, this 4,411 tons has been achieved. A quantity of 3,016 tons has been sold covering an area of 1,206 acres which gave an additional yield of 1,206 mds.

(*viii*) *Satpura Manure Scheme*—Of the target of 3,000 tons of manure to be collected and distributed. a quantity of 1,500 tons of farmyard manure was collected, of which, 1,073 tons were distributed covering an area of 470 acres which gave an additional yield of 470 mds.

(c) *Irrigation.*—(1) Constructoin of New wells and repairs to old ones—549 new wells were constructed and 116 old wells were repaired during this year.

(2) Katcha bandharas—Of the target for extension of area under katcha bandhara. viz., 2,000 acres, an area of 3,951 acres and 4 gunthas was extended. New area brought under irrigation was about 1,500 acres, which gave an additional production of 7,500 mds.

(*d*) *Propaganda and publicity, including shows.*—Special demonstrations were conducted at nearly 100 places on various subjects of agricultural improvements. Two Agricultural Shows were held at Nandurbar and at Sindhkheda which were attended by 20,000 visitors and cultivators. Publicity of all items of work done by this Department regarding 'Grow More Food' Campaign, was given in local newspaper.

(*e*) *Insect pests and plant diseases.*—3,000 lb. of sulphur dust was distributed free of cost against jowar smut for 90,000 acres. In Shahada area, dusting was made in two villages where irrigated wheat was affected by rust.

(*f*) *Special Schemes if any.*—(1) Sweet Potatoes—The target of sweet potato was 200 acres, of which 154 acres was achieved.

(2) Vegetable extension—The target for vegetable extension was 350 acres. The area under vegetable was extended by 164 acres.

(3) Tractor ploughing—Of the target of 5,000 acres, 3,000 acres of tractor ploughing was done resulting in an additional production of 9,000 mds.

(*v*) *Potato Scheme*—This scheme was not working in this district.

D. *Agricultural Demonstration Centres*

There were 17 Agricultural Demonstration Centres working satisfactorily. The Ambapur Agricultural Demonstration Centre was shifted to Mhasavad.

E. *Well Irrigation Centres*

The Scheme for Well Irrigation Centres was not working in this district.

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F. *Miscellaneous Activities*

The District Agricultural Officer took charge of the work of Secretary, District Rural Development Board, Dhulia, from January, 1950. Publications were sent regularly to the district papers every month.

K. G. KOLHATKAR,
District Agricultural Officer,
West Khandesh, Dhulia.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Seed Distribution Scheme.—5,500 Mds. of Akola bajri seed, 1,989 mds. of II, III and IV stage jowar seed, 1,590 mds. of irrigated wheat seed of II, III stages and 3,900 mds. of Chafa gram seed of the II, III, IV and V stages are to be stocked and distributed.

(2) Groundnut cake.—1,500 tons of groundnut cake are to be stocked and distributed for foodcrops.

(3) Manure mixture.—750 tons of *kharif* manure mixture and 750 tons of *rabi* manure mixture are to be stocked and distributed.

(4) Trial plots.—Trials of mug and udid are to be conducted.

(5) Town compost.—8,900 tons of town compost are to be prepared by the Municipalities of the West Khandesh district.

(6) Rural compost.—10,000 compost pits are to be dug and filled in.

(7) Construction of wells.—New wells will be constructed and old wells will be repaired.

(8) Construction of katcha bandharas.—200 katcha bandharas are to be constructed and an area of 2,000 acres is to be covered.

(9) Sweet Potato Scheme.—An area of 100 acres is to be covered.

(10) Vegetable Extension Scheme.—An area of 200 acres is to be covered.

(11) Agricultural Demonstration Centre.—The existing centres will continue. New centres will be established where the fixed period has expired.

(12) Model Agricultural Project.—Three projects, viz., Amoda, Chinchpada and Navalpur will continue.

(13) Tractor ploughing.—5,000 acres of area will be taken next year.

K. G. KOLHATKAR,
District Agricultural Officer,
West Khandesh, Dhulia.

Appendix XXIII

Summary of the Work done under the District Agricultural Officer, Sholapur, for the year 1949-50

A. *Staff and Administration*

The administration of this District was looked after by Shri V. H. Kulkarni, M.Ag., District Agricultural Officer, Sholapur during the year under report.

One Assistant District Agricultural Officer was also appointed under him to assist him in all his usual routine work. There were in all four Agricultural Officers working in this district. Three of them were in charge of Sholapur, Pandharpur and Madha Revenue Sub-Divisions and one was engaged on special type of work in the district, such as dry farming, lifting of groundnut cake from the Mills, etc.

B. *Season*

The monsoon started at the proper time this year in almost all parts of the Sholapur district, except in the Pandharpur and Sangola talukas. The sowing of *kharif* crops like bajri, tur, groundnut, etc., was done as usual, but the crops remained stunted in growth due to failure of rains afterwards. The rainfall received during the third week of September helped the *kharif* crops to take up vigorous growth and to start sowing of *rabi* jowar. Cultivated lands on the banks of Bhima, Seena and Man rivers in the Sholapur district were completely washed away due to heavy floods; as a result, resowing had to be undertaken in many places. As there were practically no rains later in the months of November and December, the dry *rabi* jowar suffered badly for want of moisture in the soil. However, the irrigated crops thrived quite satisfactorily throughout the season. In general, the season was most irregular and unhelping for the production of both *kharif* and *rabi* crops.

C. *'Grow More Food' Campaign*

(A) *Improved Seeds.*—(*i*) There is only one scheme working in this district, viz., the scheme No. 13 for multiplication and distribution of improved strains of *rabi* jowar M-35/1, wheat N-4 and chaffa gram in the extensive dry tract of the Deccan and Karnatak.

(*a*) The details of work done during the year under report are as under:—

Serial No.	Name of improved seed.	Quantity distributed in B. Mds.	Area covered acres.	Total additional production obtained in B. Mds.
1.	Jowar M-35/1	10,841-05	1,48,161	74,080-00
2.	Chafa gram	283-08	563	448-00
3.	Wheat N-4	85-32	86	64-20

(*b*) The following quantities of seeds of Akola bajri and paddy M-161 were also distributed:—

4.	Akola bajri	96-00	2,624-00	1,312-00
5.	Paddy M-161	299-00	480-00	360-00

In addition, sufficient seed of paddy, bajri, maize jowar, wheat and gram was also selected from the stocks of the Revenue Godowns to meet the genuine requirements of cultivators.

(*ii*) *Hot Weather Food Crops Campaign.*—An area of about 4,950 acres was brought under hot weather foodcrops like Hundi jowar, maize, ratoon jowar and bajri during the year under report. Thirty tons of groundnut cake and 53 tons of manure mixture were distributed for these crops by this Department. The distribution of seeds selected by this Department was done through the Revenue Godowns.

(B) *Manures*:—

(1) *Groundnut cake.*—In all 1,191 tons of cake was distributed for the crops like paddy, wheat, jowar, etc. covering an area of 7,146 acres and thus giving an additional production of 21,438 of Bengali Maunds. 2,952 tons of cake was also distributed for cattle feeding during the year under report.

(2) Manure mixture.—In all 2,467 tons of manure mixture was distributed for the crops like paddy, jowar, wheat, etc., covering an area of 24,670 acres and thus bringing an additional production of 74,010 Bengali Mds.

(3) Sulphate of ammonium.—About 277 tons of sulphate of ammonia was distributed for many foodcrops covering an area of 4,155 acres and giving an additional yield of about 12,465 Bengali Maunds.

(4) Rural compost.—15,703 pits, each of the size of 10′×6′×3′ were dug and filled during the year, thus preparing 39,257 tons of ripe compost covering an area of 7,851 acres and giving an additional yield of approximately 23,553 Bengali Maunds.

(5) Town compost.—Five Municipalities entrusted with the work of preparing and distribution of compost manure from town refuse produced 44,232 tons of compost and distributed 11,661 tons of compost covering an area of 11,661 acres.

(6) Farmyard manure Improvement Scheme.—In all 400 villages were selected in this district for the improvement of farmyard manure, and in 92 villages the work was completed.

C. *Irrigation*

Wells and Tanks.—In all 113 new wells were dug and 45 old wells were repaired during the year. This has helped in bringing an additional area of 452 and 90 acres, respectively, producing an additional production of 8,130 Bengali Maunds. Only 18 kaccha bandharas were constructed and an area of 252 acres approximately has been brought under new irrigation.

D. *Propaganda and Publicity including Shows*

The propaganda in connection with the agricultural improved methods and 'Grow More Food' together with the facilities offered by Government was made by all the district staff by calling several meetings of the cultivators in various villages. Compost pits demonstrations were also held whenever found necessary. Tree planting week was also observed successfully. Agricultural Shows were arranged at different places in the district. Training Classes were also conducted for social workers. Lectures were delivered with the help of Publicity Van all over the district on suitable occasions.

E. *Insect Pests and Plant Diseases*

Bajri crop in the Sangola and Pandharpur talukas suffered from small grasshoppers attack. Dusting of Gammexane was advocated as a control measure. The *rabi* jowar suffered from "Chikta", "Tambera" and "Khaira" diseases and the wheat crop suffered slightly in wheat rust, particularly in the month of November and December in parts of Pandharpur, Sangola and Malsiras talukas. Sulphur dusting was, however, advocated in time in order to check the further spread of the above diseases.

F. *Special Schemes*

(*i*) *Vegetable Development Scheme.*—An additional area of 618 acres was brought under Vegetable Extension Scheme, giving an additional production of 3,090 tons of vegetables.

(ii) *Sweet Potato Extension.*—An additional area of 564 acres was brought under the Sweet Potato Extension Scheme, giving an additional production of 2,256 tons of sweet potato.

(iii) *Potato Extension.*—Although this scheme was not applicable to this district, an attempt was made in this direction to distribute seed potatoes to the extent of 88 Bengali Maunds to the potato growers thus covering an area of 5 acres and 20 gunthas under the crop during the *rabi* season.

D. *Agricultural Demonstration Centres*

In all eleven Agricultural Demonstration Centres worked in the district quite satisfactorily.

E. *Well Irrigation Centres*

There are no Well Irrigation Centres in this district.

F. *Miscellaneous activities*

Tree Planting Day and Week were observed and about 15,000 seedlings were distributed and planted all over the district. Grama Sudhar Saptaha was also observed in which good many compost and farmyard manure pits were dug and filled. Purchase of oil engines and tractors was satisfactory and an appreciable area was brought under plough and *irrigation.*

V. H. KULKARNI,
District Agricultural Officer,
Sholapur.

PROGRAMME OF WORK FOR THE YEAR 1950-51

The following are the targets fixed for this district for the year 1950-51:—

(i) *Seed Scheme.*—

S No.	Name of seed.	Quantity to be purchased and distributed in B. Md.	Area to be covered in acres.
1.	Jowar M-35/1	13,812½	138,125
2.	Chafa gram	3,900	7,800
3.	Wheat N-4	970	970

(*ii*) *Manure scheme*:—

S. No.	Name of Manure.	Quantity to be distributed ni tons.	Area to be covered in acres.
1.	Groundnut cake (for cattle feeding)	3,000	—
2.	Manure mixture—		
	(*i*) *kharif*	1,368	10,944
	(*ii*) *rabi*	2,000	30,000
3.	Compost (Rural)	15,000 pits	7,500
4.	Compost (Urban)	28,690	5,738

(*iii*) *Irrigation Scheme*.—Wells Scheme:—

(*a*) No. of New wells to be constructed	1,260
(*b*) No. of old wells to be repaired	600
	acres
(*c*) Area to be brought under irrigation	6,240

(*iv*) *Special Schemes*:—

(*a*) Sweet Potato Extension

	Area to be extended acres.
(*i*) *Kharif*	100
(*ii*) *Rabi*	100
(*b*) Vegetable Development	500

(*v*) *Farmyard manure*.—410 new villages will be selected and the work of improvement of farmyard manure will be introduced and 28,800 new pits will be dug and filled during the year.

V. H. KULKARNI,
District Agricultural Officer,
Sholapur.

Appendix XXIV

Summary of the work done under the District Agricultural Officer, Kolhapur, for the year 1949-50

A. *Staff and Administration*

The Kolhapur State was merged with the Bombay State from the 1st August, 1949, and as such, the intensive work as undertaken in other districts, could not be started from the beginning of the agricultural season in the year 1949.

Shri G. V. Wazalwar held charge of the post of District Agricultural Officer, Kolhapur, during the year under report. The following staff was sanctioned for the Kolhapur district:—

(1) One Assistant District Agricultural Officer.

(2) Four Agricultural Officers I/C Revenue Sub-Divisions.

(3) Forty four Agricultural Assistants in the II and III grades.

B. *Season*

In the year 1949, the monsoon started early in this district, i e., by the third week of May, and as such, sowing of paddy was taken up by the cultivators much earlier than what they used to do. Though the rainfall in the beginning was sufficient for the sowing of the crop still during the months of June and July, the weather used to be cloudy and there was not sufficient precipitation. Owing to the humidity in the atmosphere paddy crop suffered from blast, blue beetle pest and grasshoppers. Jowar and other crops also suffered. During August and September, there was a break and for want of sufficient moisture the crops did not have normal growth. On the other hand, the yield also suffered. Thus it will be seen that the *kharif* crops in this district suffered in two ways.—(1) for want of sufficient precipitation crops suffered from various diseases and pests and (2) in the latter part they suffered because of drought.

The crops in the rabi season also suffered for want of moisture in the soil and except in places where there were facilities for irrigation, the crops were much damaged. Wheat particularly suffered from wheat rust though the damage was not universal. The weather, therefore, during the year 1949-50 could not be called a normal one from agriculturists' point of view.

C. *Grow More Food Campaign*

(*a*) *Seeds.*—Seed multiplication and distribution.—The following kinds of seeds were supplied to this office and the same were distributed to the cultivators. It may kindly be noted in this connection that all the seeds received could not be distributed to the cultivators owing to:—

(1) Transfer of two talukas of this district to the Belgaum district, and

(2) The cultivators had not sufficient expendience of the improved varieties of seeds as the seeds were supplied to this district for the first time.

Name of Seed.	Quantity received B. Mds.	Quantity distributed B. mds.
Paddy	56-20	46-35
Akola bajri	162-12	152-42
Chafa gram	16-00	16-00
Groundnut	10-00	10-00
Jowar M-35-1	808-00	416-48
Jaya wheat	0-97	0-84

Besides these, 40 tons of overseas wheat were received for being distributed to the cultivators to meet their requirements of general seed in this respect. But, of this, 490 B. Mds. and 34 lbs. were distributed to them for sowing.

(*b*) *Distribution of manures and fertilisers.*—

(*i*) *Ammonium Sulphate.*—The Kolhapur State had in stock about 974 tons of sulphate of ammonia and 500 tons of superphosphate. Of this, nearly 700 tons of sulphate of ammonium were distributed to the cultivators for paddy crop and nearly 450 tons of superphosphate were distributed as a basic dose, linked up with sulphate of ammonium.

In addition to this stock Government allotted 5,800 tons of sulphate of ammonium and 1,500 tons of superphosphate for food and other crops. Sulphate of ammonium was made available for food and nonfoodcrops both. During the year under report, about 2,000 tons of sulphate of ammonium and 31 tons of superphosphate were distributed for food and nonfoodcrops. Thus nearly 2,700 tons of sulphate of ammonia and about 480 tons of superphosphate were distributed in the year under report.

(*ii*) *Manure mixture.*—550 tons of manure mixture were received and the whole of it was distributed to the cultivators for *kharif* and *rabi* foodcrops.

About 174 tons of potato mixture were received from the District Agricultural Officer, Ratnagiri, for distribution in this district and only about 50 tons could be distributed for potato and tuber crops.

In addition to the above mentioned quantity of manure mixture, 1,125 tons of this mixture were allotted for this district for the crop season of 1950-51. Of this quantity, 1,070 tons were received and 395 tons were distributed.

(*iii*) *Groundnut cake.*—The allotment of groundnut cake for this district was 5,050 tons. This allotment was both for cattle feeding and manure. Of this, about 1,200 tons were distributed to the cultivators.

(*iv*) *Compost.*—During the period of the State Government and also after the merger of the Kolhapur State with the Bombay State, 4,300 compost pits were prepared. The scheme of town compost was taken up during the year under report.

(*v*) *Farmyard manure.*—The work of farmyard manure was to be undertaken in 470 villages, but the actual work of standardising farmyard manure pits was taken up in 70 villages only.

(*vi*) *Crop protection.*—In the year under report, 365 lbs. of sulphur dust was distributed for treatment of jowar seed against smut. 13 lbs. of perenox were utilised against paddy blast. 5,600 lbs. of Gammexane and 1,120 lbs. of Hexyclan were used against wingless grasshoppers on paddy and jowar. It was also used against blue beetle. The strength of this Insecticide was 5 per cent.

6 lbs. of lead arsenate were distributed against Wolves and 240 lbs. of Barium Corbonet was distributed against rats.

(*vii*) *Sweet Potato and Vegetable Extension.*—The extension of area under sweet potato was taken up and 500 additional acres were brought under this crop. Seeds of vegetables to the extent of 48 lbs. and about 1,000 seedlings were distributed to the cultivators.

D. *Miscellaneous activities*

Tree Planting.—About 31,000 fruit plants and 20,000 ornamental tree plants were distributed during the tree planting week celebrated from the 1st August to the 22nd of August, 1949.

G. V. WAZALVAR,
District Agricultural Officer,
Kolhapur.

PROGRAMME OF WORK FOR THE YEAR 1950-51

1. Seeds—

Owing to the recent merger of the Kolhapur State there was no procurement of improved seeds in the year 1949-50. The list of nuclear seed received and to be received for the year 1950-51 is given below:—

		B. Mds.
Paddy	...	64
Bajri	...	75
Wheat	...	100
Nagali	...	1¾
Chafa gram	...	50
Ambadi	...	18-76
Jute	...	4-49
Groundnut	...	5-62

2. Manures—

(*i*) *Groundnut cake.*—5,050 tons of groundnut cake are to be distributed as under:—

3,000 tons for foodcrops for 18,000 acres.

2,000 tons for cattle feeding.

50 tons for other subsidiary crops.

(*ii*) *Manure mixture.*—1,125 tons of manure mixture are to be distributed to cover an area of 7,875 acres of foodcrops.

(*iii*) *Superphosphate.*—A quantity of 1,500 tons of this manure is to be distributed for 10,500 acres of foodcrop.

(*iv*) *Rural compost.*—5,000 pits are to be dug to prepare 7,500 tons of manure. About 5,000 pits prepared during the last year will be filled up again during this year.

(*v*) *Town compost.*—11,800 tons of night soil manure are to be supplied to the cultivators for foodcrops to cover an area of 2,360 acres.

(*vi*) *Farmyard Manure.*—28,800 pits in 410 villages are to be standardised. The manure will be sufficient to cover 14,400 acres.

(*vii*) *Vegetable and sweet potato Extension Schemes.*—400 acres under vegetables and 400 acres under sweet potato are to be extended during this year.

(*viii*) *Crop Protection.*—(1) Sulphur.—2,000 lbs. of dust are to be distributed in order to control jowar smut over an area of 60,000 acres.

(2) Gammexane.—40 tons of 5 per cent gammexane are to be dusted against jowar grasshoppers over an area of 2,800 acres.

(3) Steps will be taken to apply the crop Pests and Diseases Act to affected areas, if necessary.

3. Agricultural Demonstration Centres.—Twenty-two Agricultural Demonstration Centres are to be started.

4. Miscellaneous activities.—

(*i*) *Tree planting.*—1,00,000 seedlings are to be planted during this season.

(*ii*) *Crop cutting experiments.*—The inspection of crop cutting experiments is to be done to find out the effect of manure and improve seed.

G. V. WAZALWAR,
District Agricultural Officer,
Kolhapur.

APPENDIX XXV

Summary of the work done under the District Agricultural Officer, Ratnagiri, for the year 1949-50

A. *Staff and Administration*

Shri S. Y. Sawant continued to hold the charge of the post of District Agricultural Officer, Ratnagiri, throughout the year, under report.

Shri G. S. Agashe, previously working as the Agricultural Officer, (C. D.) Ratnagiri, was appointed Assistant District Agricultural Officer from the 24th June, 1949. There were three Agricultural Officers, for Northern Division, Central Divisions and Southern Divisions of the district. The executive staff stationed at the Agricultural Centres was changed from 63 to 65 Agricultural Assistants this year, as two more posts were sanctioned under the Crop Protection Scheme.

B. *Season*

The rainfall received during the year was more than the normal, and it was also unevenly distributed as regards its periodicity. This year, the rains started earlier than usual in the 4th week of May and continued upto mid-June. After

the break of over three weeks thereafter, the rains re-started with more vigour from the second week of July. The precipitation in July and over a greater part of August, was quite adequate. The September opened with heavy showers, accompanied by storm. In the third week of this month, the intensity of the fall was the highest. However, these rains proved a last stroke and the following months were dry. The seasonal total rainfall was as much as 146″ nearer the sea and 150″ nearer the hills. The break in rains in June, delayed the sowing and transplanting operations. However, the crop condition was satisfactory due to good rains in July and August. The heavy rainfall in the first half of September adversely affected the crop condition and slightly damaged the standing crops, causing shredding of grains. The total damage was from 15 to 20 per cent in normal field bringing down the crops from 8 to 10 annas. The cloudy and dull weather, with cold winds in February, nullified the early promise of successful mango crop. The late rains in September, proved beneficial to rabi crops and the yield of millets was normal.

C. *Grow More Food Crops Campaign*

(*a*) *Seeds.*—9,946 B. Mds. of seed of improved paddy strains were purchased in the district, and of this 9,661 B. Mds. of seeds was distributed. The seed was sufficient for 9,661 acres.

141 B. Mds. of pure pedigree paddy seed was purchased and distributed to the registered seed growers. This was sufficient for 141 acres.

534 Mds. of nagli seed was purchased and of this, 363 Mds. were distributed as seed to cultivators, to cover an area of 300 acres.

(*b*) *Manures.*—3,063 tons of manure mixture prepared specially for rice crop was distributed during the year under report, and this was sufficient for 24,504 acres.

Similarly 88 tons of sulphate of ammonia was stocked and of this 69 tons were distributed to cover an area of 1,035 acres.

3,000 tons of groundnut cake was purchased and 2,743 tons of cake was sold for cattle feeding. No cake was distributed for manurial purposes.

Compost Pits.—7,669 compost pits were dug in rural areas, of which 5,429 were filled. The manure expected from these pits is 13,570 tons, which will be sufficient for 2,714 acres.

(*c*) *Irrigation.*—Vigorous propaganda was undertaken to induce the cultivators for putting bandharas across the rivers

and nalla, to enable growing of pulses and waingan paddy crop. The subsidy of Rs. 3,933 was given to the cultivators for bringing the area of about 655 acres under the command of about 400 bandharas.

(*d*) *Propaganda and Publicity including shows.*—In all about 400 lectures were delivered on agricultural activities at the celebration of the Tree Planting Week and Gram Sudhar Saptaha in the year 1949.

A big Agricultural Exhibition was held at Gopuri in Kankavli mahal, in the month of April, 1950, under the auspices of the District Rural Development Board, Ratnagiri, Shri R. K. Patil, the then Food Commissioner, Central Government, in company of Shri M. P. Patil, the Honourable Minister for Forests and Agriculture, Bombay, graced the occasion by opening the Show. In this exhibition, various fruits and fruit products, grafts and small agricultural industries were exhibited. Nearly 2,000 cultivators attended this exhibition. Prices and certificates were given for good samples. Besides this, nearly 15 small demonstrations on compost and Farm Yard Manure were held on cultivators fields. Two articles viz. (1) on, "Kulthi Scheme" and (2) on, "Jute Cultivation", in Ratnagiri District, were published in local news papers. Similarly a large number of pamphlets and posters, on various Grow More Food Schemes, Tree Planting Week, etc. received from the Directorate of Publicity, Bombay were distributed as a part of the propaganda of the Agricultural Department.

(*e*) *Insect Pests and Plant Diseases.*—There were no major pests and plant diseases. The army worms had appeared in some local fields of Devgad and Sawantwadi talukas but the attack was not of a serious nature and the damage was negligible. Equipments and materials required to check the blast disease on Paddy crop, have been purchased and kept ready as per scheme sanctioned by Government recently.

(*f*) *Special Schemes, if any.*—(*i*) *Vegetable Development Scheme*—Vegetable seeds worth Rs. 2,000 were purchased for the rabi season and were distributed to cultivators at cost price.

(*ii*) *Kulthi Seed distribution scheme.*—A quantity of 3,060 B. Mds. of Kulthi seed was purchased, of which, the actual distribution of seed was 1,530 B. Mds. and the area covered by that was 7,650 acres. The additional yield expected was 19,125 B. Mds.

D. *"Jute and Ambadi" cultivation Scheme*

Having found this district as the best tract for extending jute and ambadi fibres, 4,513 lbs. of jute seed and 9,178 lbs. of ambadi seed were purchased for distribution. Out of the Jute seed collected, 2,917 lbs. was distributed to cover an area of 292 acres. From the total collection of ambadi seed, only 1,906 lbs. of seed was distributed.

E. *Agricultural Demonstration Centres*

There are eight Agricultural Demonstration Centres, functioning in this district. The owners of the centres have no desire to co-operate with the Department and to allow their farms to be used as Agricultural Demonstration Centres, unless they get substantive remuneration for the purpose.

F. *Miscellaneous Activities*

(*i*) The District Agricultural Officer attended the 'Grow More Food' Crops Committee meetings and the Executive Committee meetings of the District Rural Development Board, Ratnagiri, and gave technical advice on all matters, pertaining to agricultural activities in the district.

(*ii*) With a view to knowing the conditions regarding the existing state of preparation of farmyard manure in each village all the villages in the district were surveyed by the Agricultural Assistants, Circle Inspectors, etc., and the reports thereof have been received in the form accompanying Government Circular, Agriculture and Forests Department No. 3698, dated the 16th February 1950.

(*iii*) *Statistical work.*—Area recording of 'Grow More Food' aids, and crop cutting in experimental plots have added greatly to the work of this Section. The officers had also to supervise the crop cutting carried on by the Revenue Department. Training Classes for the Agricultural Officers and Agricultural Assistants were conducted in June and July, 1949. As the work of statistics clashed with the distribution season, Independence day, Harijan Day and Gram Sudhar Saptah, it could not be done to the satisfaction of the Statistician.

S. Y. SAWANT,
District Agricultural Officer,
Ratnagiri.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Compost making in rural areas—target 6,000 pits.

(2) Improvement of farmyard manure and demonstrations thereon—target 340 villages.

(3) Construction of temporary katcha bandharas—target 1,000 bandharas.

(4) Extension of vegetable and sweet potato cultivation—target of vegetable cultivation is 500 acres and that of sweet potato extension is 50 acres.

(5) Collection of jute and ambadi seeds and their distribution.

(6) Supply of insecticides and fungicides for the protection of crops under the Crop Protection Scheme.

(7) Agricultural propaganda, demonstrations of standing crops, trials on crops and crop cutting experiments etc.

(8) Multiplication of seed of paddy and nagli seeds upto the III stage and their distribution through the registered seed growers.

S. Y. SAWANT,
District Agricultural Officer,
Ratnagiri.

APPENDIX XXVI

Summary of the Work done under the District Agricultural Officer, Kolaba, Alibag, for the year 1949-50

A. *Staff and Administration*

Shri S. T. Purandare continued to hold charge of the post of District Agricultural Officer, Kolaba, throughout the year under report. He was assisted by one Assistant District Agricultural Officer in his day to day routine work. There were three Agricultural Officers incharge Revenue Sub-divisions and 47 Agricultural Assistants working in the district.

B. *Season*

On account of early showers in the third week of May, sowing of paddy and millets was done earlier. Rainfall in June was scanty and hence transplanting operation was delayed.

Unusual heavy rains were received in the month of September. The rainfall in October damaged the crop. The total quantity of rainfall was more than the normal, but its distribution was uneven. The peculiar behaviour of rainfall was responsible for increased incidence of Blast disease and Blue Bettle pest.

C. *'Grow More Food' Campaign*

(1) Improved Seed distribution.—The paddy scheme had completed one cycle of multiplication. It is estimated that 80 per cent of the suitable area was covered. During the year under report, 20,254 B. Mds. of paddy seed was distributed to cover an area of 40,508 acres to give an estimated additional yield of about 1,430 tons.

(2) Manure distribution.—(*a*) *Manure mixture*—A quantity of 4,591 tons of manure mixture was used for manuring paddy crop so as to cover an area of 36,730 acres. The estimated additional yield on this account would be 2,500 tons.

(*b*) Sulphate of Ammonia—Sulphate of ammonia is mostly used for manuring vegetables and garden crops and also for encouraging the growth of paddy seedlings in the seed bed. A quantity of 270 tons of sulphate of ammonia was distributed during the year.

(*c*) Rural Compost Scheme—The total number of pits dug and filled during the year amounted to 6,043 and 5,860, respectively. The ripe compost from these pits will be utilised for paddy crop of the next year over an area of 5,860 acres.

(*d*) Town Compost Scheme—Four Municipalities started compost making during the year. Compost was not ripe and hence there were no sales.

(3) Extension of vegetables and sweet potato cultivation.—The additional area brought under vegetables and sweet potato during the year was 152 acres and 537 acres, respectively.

Groundnut cake was distributed for cattle feeding. The quantity amounts to 1,841 tons.

(4) Horticultural Work.—Supply of mango grafts and coconut seedlings was made to the extent of 1,500 and 500 numbers, respectively.

The work on Kolad Nursery (Rural Development Board Nursery), was carried out as per plan. 550 grafts were prepared for sale on this nursery.

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(5) Pests and diseases control.—The attack of Blast disease and Blue Beetle Pest was acute in localities in the Karjat, Khalapur, Mahad and Poladpur talukas. Remedial measures such as spraying prenox and dusting BHC (Gammexane or Hexyclan) were carried out on about 2,000 acres. The cultivators were not prepared to purchase insecticides at the cost price and hence large scale measures could not be adopted.

(6) Shows, Exhibitions and Propaganda.—The staff of the Agricultural Department whole heartedly took part in the celebration of Harijan Day on the 25th September, Gram Sudhar Saptah from the 2nd October to the 9th October, and Tree Planting Campaign in August on the occasion of Independence Day. Demonstrations of compost making was the main programme in Gram Sudhar Saptah. During tree planting week, 22,300 trees were planted.

A District Agricultural and Cattle Show was organized at Sajgaon by the Agricultural Department. 20 stalls of all modern improvements were put up with samples, models, charts, maps, posters and demonstrations. The Honourable Minister for Forests and Agriculture, visited the show and distributed prizes.

The Honourable Minister also held the District Food Conference after the show.

D. *Agricultural Demonstration Centres*

The number of Agricultural Demonstration Centres remained constant. The cropping schemes were prepared and carried out in consultation with the owners. The Agricultural Assistants attached to the Agricultural Demonstration Centres looked after the routine farm work of the Centres and maintained accounts. They also held number of demonstrations of standing crops and organized propaganda meetings in the vicinity of the Centres, where they distributed leaflets and pamphlets on 'Grow More Food' Campaign.

S. T. PURANDARE,
District Agricultural Officer,
Kolaba, Alibag.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Purchase of improved seeds, stock the same and distribute it for further multiplication. The quantity to be purchased is 16,660 B. Mds.

(2) Stocking and distribution of groundnut cake, manure mixture and sulphate of ammonia for foodcrops and vegetables as under:—

(*i*) Groundnut cake—1,500 tons.

(*ii*) Manure mixture—3,000 tons.

(*iii*) Sulphate of ammonia—200 tons.

(3) Stocking and distribution of 1,000 tons of groundnut cake for cattle feeding.

(4) Rural compost scheme—8,000 new pits to be dug and filled.

(5) Town compost scheme—All the 10 Municipalities to be assisted in making compost from town waste. The target for the district is 4,600 tons.

(6) Extension of vegetables and sweet potato cultivation.—The additional area to be extended under vegetables is 150 acres and under sweet potato 500 acres.

(7) Horticultural Work—Supply of mango grafts and other types of seedlings of fruit trees.

(8) Kolad Nursery work to be continued under the Rural Development Board, Kolaba, and all assistance to be given.

(9) Control of pests and diseases—Large scale measures against the Blast disease and Blue Beetle pest on paddy to be taken.

(10) Work on all Agricultural Demonstration Centres to be continued and more Agricultural Demonstration Centres to be started.

(11) All sort of assistance and co-operation to be given in rural development activities of the Rural Development Board.

(12) To co-ordinate the work of all sections, such as boring, tractor ploughing, etc., of the Agricultural Department in this district.

S. T. PURANDARE,
District Agricultural Officer,
Kolaba, Alibag.

Appendix XXVII

Summary of the work done under the District Agricultural Officer, Thana and Bombay Subarban District, Thana for the year 1949-50

A. *Staff and Administration*

Shri D. H. Joshi was the District Agricultural Officer for the whole year and he was assisted by one Assistant Agricultural Officer, 4 Agricultural Officers and 55 Agricultural Assistants.

B. *Season*

On the whole the season was normal, except the break in the rainfall from the 2nd to the 4th week of June and heavy rains in the 3rd week of September causing loding of paddy crop in general.

C. *Grow More Food Campaign*

(*a*) *Seeds.*—(*i*) Seed multiplication scheme of improved paddy varieties of K-42, K-540, K-226, Z-31, Z-149 was in operation and 24,799 maunds of improved paddy seed, and 300 maunds of local paddy seed, covering an area of 49,598 acres and 600 acres, respectively, were distributed to the cultivators. 29,115 maunds of paddy seed was purchased and stored for 1950-51. 713 maunds of rabi seed was distributed covering an area of 1,500 acres.

(*ii*) 198 maunds of Z-31 and K-540 paddy seeds, were supplied to the Dangs district for 1949 kharif season.

(*iii*) No Hot Weather Crops were taken in this district.

(*b*) *Manures.*—(*i*) *Groundnut cake*—415 tons of groundnut cake was distributed for cattle feeding.

(*ii*) *Manure mixture*—3,534 tons of manure mixture was distributed during the year for food-crops covering an area of 28,272 acres.

(*iii*) *Sulphate of ammonia*—786 tons of sulphate of ammonia was distributed for paddy and vegetables sufficient for an area of 11,790 acres. 10 Tons of superphosphate was distributed to cover an area of 224 acres.

(*iv*) *Rural Compost.*—4,474 compost pits were dug and 3,550 pits were filled by the Agricultural Department. In addition to this, about 10,000 pits were dug and filled by the Revenue

Department. 1,917 pits were opened and the manure was used for 958½ acres.

(*v*) *Town Compost.*—68 tons of town compost prepared by the Thana Municipality was sold for covering an area of 13½ acres.

(*vi*) *Praparation of farm-yard manure pits by the improved method.*—199 pits were got dug and filled in 10 villages.

(*vii*) *Use of cattle dung manure.*—10,090 tons of cattle dung manure was supplied at concessional rate from B. S. D. and it was sufficient to cover an area of 2,018 acres.

(*c*) *Irrigation.*—(*i*) 38 new wells were constructed and 11 old wells were repaired.

(*ii*) 11 pacca bandharas and 3 kacha bandharas were constructed.

(*d*) *Propaganda and publicity including shows.*—663 meetings were addressed to cultivators and the information about the agricultural improvements were explained to them. 2 big shows and nearly 106 demonstrations of standing crops were held. One District Agricultural Show was also held.

(*e*) *Insect pests and plant diseases.*—Blast disease, Blue Beetle and Rice case worm attacked the paddy crop and remedies were taken against them. Perenox was treated on an area of 4 acres against the blast disease. Pyrodust and Pyrocollide were treated on an area of 88 acres against blue beetle and rice case worm, respectively.

(*f*) *Special schemes, if any.—Vegetable and sweet Potato Development Scheme.*—Additional areas of 457 acres and 26½ gunthas under vegetables and 400 acres and 17 gunthas under sweet potato were brought under cultivation and vegetable seeds worth Rs. 100 were distributed to the bungalow owners and local institutions free of cost to encourage cultivation in the bungalow campounds.

D. *Agricultural Demonstration Centres*

There were 14 Agricultural Demonstration Centres working in the district and agricultural improvements were carried on there.

E. *Miscellaneous Activities*

(1) Gram Sudhar Saptaha was observed in the 1st week of October and about one hundred demonstrations of filling the farmyard manure pits and the compost pits were held.

(2) Tree Planting week was observed twice, once in the 1st week of July and secondly in the 3rd week of August and 6,000 trees were got planted departmentally and 54,000 plants were got planted through the Rural Development Board in co-operation with the Revenue Officers and the officers of other Department.

(3) Thin planting of Rice—The method of thin planting of rice was carried on in 47 villages in the Vade Taluka.

(4) Amelorative measures for Backward Classes.—Seeds and manures worth Rs. 190 and fruit trees worth Rs. 200 were distributed to the backward cultivators free of cost. Harijan Day was observed on the 26th September to remove social disabilities and promote their welfare.

(5) Extension of areas under jute and ambadi.—About 181½ lbs. of jute seeds were purchased locally. Propaganda for extension of jute and ambadi was undertaken.

D. H. JOSHI,
District Agricultural Officer,
Thana and Bombay Subarban District,
Thana.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Purchase and distribution of improved strains of rice.
(2) Purchase and distribution of groundnut cake, manure mixture, sulphate of ammonia and superphosphate.
(3) Digging and filling of rural compost pits.
(4) Preparing of town compost and its distribution.
(5) Preparation of farmyard manure pits by the improved method.
(6) Distribution of cattle dung from the Bombay Suburban district.
(7) Extension of area under vegetables and sweet potato.
(8) Construction of new wells and repairs of old wells.
(9) Construction of bandharas.
(10) Extension of areas under jute and ambadi.
(11) To conduct district trials of improved seeds and manures.
(12) To hold demonstrations and shows.
(13) Control of pests and diseases.

D. H. JOSHI,
District Agricultural Officer,
Thana and Bombay Suburban District,
Thana.

Appendix XXVIII

Summary of the work done under the District Agricultural Officer, Dangs, Ahwa, for the year 1949-50

A. *Staff and Administration*

Shri R. Y. Pawar held charge of the post of District Agricultural Officer, Dangs. He was assisted by 6 Agricultural Assistants.

B. *Season*

The rainfall started from the first week of June as usual and continued for about three weeks and thereafter there were dry days for two weeks. Later on, rains were favourable, but this caused blast on paddy very severely and some pest on nagli and vari, which affected the yield by about 50 per cent in paddy and 20 per cent in nagli and vari. In *rabi* season weather was favourable, but in February, there was heavy frost, which affected the yield of the crops by 50 per cent. Thus, on the whole, the season for agriculture was not so favourable to the crops.

C. *"Grow More Food" Campaign*

(*a*) *Seeds.*—During the year, the following seeds were distributed with a view to facilitating the increase in area under cultivation and to increasing the yield:—

	Quantity in B. Mds.
Improved paddy seeds ...	335
Local paddy seeds ...	595
Tur ...	20
Chafa gram ...	30

The above distribution figures are for the period from July, 1949, to June, 1950.

(*b*) *Manures.*—During the year, 120 tons were distributed. No groundnut cake was indented or received during the period. Five tons of superphosphate was received but till July, 1950, no distribution was made as the backward Dangi cultivators were unwilling to pay high cost of this fertilisers.

During the year, 200 tons of manure mixture was indented, and only 50 tons of the mixture was received as it was directed that the cultivators should not be induced to take this manure.

Rural Compost.—During the year, 11,692 compost p.ts were dug of which, 6,824 were filled in according to the requirements while, the others were rejected for small size or incomplete filling.

Farmyard Manure.—This work was proposed to be taken in the coming year.

(c) *Irrigation.*—No solid work could be done for some reasons but kachha bandhara and few wells can be constructed next year. Cultivators were persuaded to construct wells, but due to some reasons, no tagavi was sanctioned.

(d) *Vegetable Development.*—Up to the end of June, 1950, sweet potato vines to cover an area of about 200 acres were distributed. The vines were obtained from the Kosbad Agricultural School as well as from the Agricultural Demonstration Farm at Bhawangadh. Vegetable seeds were distributed to the villagers through the village school teachers. In addition, agricultural implements were given to some well progressing schools for vegetable cultivation and seeds and manures were also supplied for this purpose. The cost of sweet potato vines, vegetable seeds, seeds and manures, was paid from the Village Improvement grants and sanctioned by the Collector.

(e) *Propaganda and publicity.*—A batch of cultivators was taken to various paddy cultivation centres to show the effect of manures, system of cultivation, bunding, kachha bandhara system, etc., and this created an ideal effect on the cultivators. Exhibition with Poultry and Cattle show was held in February, 1950, and a Village Workers' Training Class was also held in November, 1949. There was a very good response to these activities. Seven 'Grow More Food' meetings were held in June, 1950 and effective propaganda was carried out for manures, land development etc.

D. *Agricultural Demonstration Centres*

Six Agricultural Demonstration Centres were sanctioned by Government for a period of five years. Till the end of this year, only four were brought under operation, while the rest could not work for want of staff. Trial plots for manures, number of seedlings to be planted at a place for paddy, raising of paddy seedlings without rabbing, etc., were carried out. This served a very good purpose in the propaganda.

R. Y. PAWAR,
District Agricultural Officer,
Dangs, Ahwa.

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PROGRAMME OF WORK FOR THE YEAR 1950-51

1. Seeds—

It is proposed to distribute the following seeds.—

(*i*) 2,000 B. Mds. of improved paddy seeds.

(*ii*) 50 B. Mds. of chafa gram.

(*iii*) 20 B. Mds. of N-4 wheat.

(*iv*) 50 B. Mds. of Jowar.

(*v*) 80 B. Mds. of tur.

(*vi*) 50 B. Mds. of Kodra.

(*vii*) 25 B. Mds. of improved strain of udid.

2. Manure.—It is proposed to distribute the following manures:—

(*i*) 300 tons of manure mixture.

(*ii*) 50 tons of groundnut cake for cattle feed.

Compost and farm-yard manure pits will be dug and filled in as under:—

(*i*) 5,000 compost pits.

(*ii*) 5,000 farm-yard pits.

3. Bunding.—It is proposed to bring an area of 500 acres under scientific bunding.

4. Irrigation.—It is proposed to undertake the following works:—

10 kaccha bandharas to be constructed.

30 wells for agricultural purpose to be constructed.

5 lift irrigation devices to be adopted.

5. Demonstrations and Shows.—Various demonstrations on improvement of agriculture as well as Agricultural Shows, Cattle and Poultry Shows, Village Workers' training Class, etc., are proposed to be organised.

R. Y. PAWAR,
District Agricultural Officer,
Dangs, Ahwa.

Appendix XXIX

Summary of the work done under the District Agricultural Officer, North Kanara, Karwar, for the year 1949-50

A. *Staff and Administration*

Shri V. S. Habbu, B. Ag., was the District Agricultural Officer, Kanara, throughout the year under report. In addition to this, he held charge of the post of Agricultural Officer, Indoor Colonisation Scheme, after the retirement of Shri S. G. Kadkol, i.e., from the 20th June, 1950. The district staff consisted of one Assistant District Agricultural Officer, 3 Agricultural Officers (including the Agricultural Officers in the Koleroga Investgation Scheme) and 65 Agricultural Assistants. The office staff consisted of one Head Clerk, 4 Senior Clerks and 7 Junior Clerks.

B. Season

Average rainfall of the district was 93 inches. The rains commenced by about the 7th of May, 1949, and were premature for the district, except in the drilled tract. Heavy monsoon showers necessiated sowing of seeds a second time. In the drilled tract the season for sowing was favourable. Halyal and Mundgod received little rain in July, when Hodta operations were to be carried out. This could not be done satisfactorily with the result that there was a heavy growth of weeds which had to be removed by hand. This could not be properly done due to shortage of labour. Otherwise, the season was favourable.

C. *Grow More Food Campaign*

(*a*) *Steds.*—(*i*) *Mugad strains* for the drilled tract of the *upghats*—10,874 Bengali maunds of seed was stocked for the season of 1949-50, of which, 7,896 maunds were distributed covering an area of 7,896 acres.

(*ii*) *Kumta Farm strains for the transplanting area of the coast.*—1,434½ Bengali maunds of seed was stocked, of which 1,204 Mds. were distributed covering an area of 2,408 acres. The remaining stock was sold to the Revenue Godowns.

(b) *Manure* (*i*) *Manure mixture*—1,263 tons of manure mixture was distributed against a target of 2,250 tons, for paddy crop covering an area of 17,682 acres, as against 1,134½ tons in the year 1948-49. Increased yield is estimated at 1,263 tons.

(*ii*) *Groundnut cake*—500 tons of groundnut cake was distributed for cattle feeding only.

(2) (*i*) *Rural Compost*—7,000 pits were dug and filled in. 17,500 tons compost was prepared from the above pits. In addition to this, old pits were also re-filled.

(*ii*) *Town compost*—1,500 tons of compost was prepared by 5 municipalities for distribution among the cultivators.

(*c*) *Irrigation.*—(*i*) During the year 1949-50, 19 wells were constructed and 3 wells were repaired as against the target of 25 and 30 wells, respectively.

(*ii*) *Temporary bandharas*—1,131 bandharas for irrigating 9,530 acres, were constructed, as against 868 bandharas irrigating 6,808 acres in the year 1948-49. The additional area irrigated as compared to that of last year was 2,722 acres. The additional yield obtained thereby was 194½ tons.

(*d*) *Propaganda and publicity including shows.*—Wide publicity was given to 'Grow More Food' schemes by distributing pamphlets, circulars, etc., even to the remotest villages and hamlets. The response shown by the public was very encouraging.

A District Agricultural and Cattle Show was arranged at Kumta in the month of March, 1950, under the auspices of the District Show Committee. About 20,000 cultivators visited the show.

(*e*) *Insect pests and diseases.*—(*i*) *Grasshopper pest.*—The pest appeared on an area of about 5,000 acres in Haliyal Taluka. Dusting of Hexyclan was undertaken on voluntary basis, but this was found unsatisfactory as all the cultivators could not join in the campaign. Government was, therefore, moved to apply insect pest Act to the whole of the Haliyal taluka this year.

(*ii*) *Kaneroga.*—This appeared in virulent from all over the district, particularly in the below-ghat talukas. No effective remedy has been found out as yet.

(*iii*) *Blast disease.*—It had made an entry and affected the fine varieties of paddy.

(*iv*) *Koleroga of betelnuts.*—Spraying against Koleroga with Bordeaux Mixture was undertaken. About 800 acres were sprayed in all.

(*f*) *Special schemes if any.*—(*i*) *Vegetable scheme*—588 acres have been extended under the above scheme as against the target of 615 acres.

(*ii*) *Sweet potato.*—652 acres were extended under sweet potatoes during the season of 1949-50 as against the target of 875 acres.

(*g*) *Cultivation of waste lands.*—Of the 14 schemes sanctioned in the Mundgod taluka, 4 schemes were in operation. The area brought under cultivation during the kharif season of 1950 was as under:—

Name of scheme.	Total area.	Area cultivated		Total area.	No. of families settled.
		Paddy	Others.		
	Acres.	Acres.	Acres.	Acres	
Indoor	1,500	984	215	1,199	142
Ramapur	360	184	82	266	30
Koppa	152	98	68	166	16
Aringiri	446	254	92	346	41
Total	2,558	1,520	457	1,977	229

Schemes in the Ankola taluka.

Name of scheme	Total area.	Area cultivated.		Total area.	No. of families settled
		Paddy.	Others.		
	Acres	Acres.	Acres	Acres.	No.
Hillur	268	220	2	222	41
Dongri	361	308	—	308	63
Kuntagani	245	100	—	100	31
Total	874	628	2	630	135
Schemes in the Honawar taluka.					
Janakadkal	175	40	—	40	9

D. *Agricultural Demonstration Centres*

Eleven agricultural demonstration centres are working in the district. Opening of additional agricultural demonstration centres is under consideration. Improved methods of agriculture were adopted at the Agricultural Demonstration Centres and trials of manured and unmanured plots with improved strains were arranged to convince the effects of manure mixture.

E. *Miscellaneous activities*

(*i*) *Woven wire fencing scheme.*—A scheme for 100 miles has been sanctioned by Government. The work of fencing was in progress in the Indoor Colony.

(*ii*) *Barbed wire.*—5 tons of barbed wire supplied by Government was distributed among the cultivators for fencing the fields.

(*iii*) *Tree Planting Campaign.*—The Agricultural Department distributed 9,100 fruit plants and coconut seedlings and the Divisional Forest Officers, Eastern Division, Western Division and Northern Division distributed 38,568 forest species.

(*iv*) *Prizes for compost making.*—The following 9 villages were awarded prizes for digging and filling more than 150 pits.

Name of the taluka	*Name of the villages.*
Mundgod	Malgi and Indoor.
Sirsi	Badangod, Sadashivalli and Hunsekop.
Kumta	Gokarn and Baad.
Haliyal	Tergaon.
Bhatkal	Bailur.

(*v*) *High yield competition for paddy.*—More than 110 cultivators responded to the call. 31 have been awarded prizes. The yield obtained per acre was as under:—

Between 5,000 and 5,830 lb.	12 cultivators.
Between 4,000 and 5,000 lb.	13 cultivators.
Between 3,000 and 4,000 lb.	5 cultivators.
Between 2,000 and 3,000 lb.	1 cultivator.

(*vi*) Attention was paid to all the rural activities of the district Rural Development Board, such as meetings, Social Workers Classes, etc., All sorts of pamphlets pertaining to agriculture were issued among the peasants.

(*vii*) Two Refresher Classes were held for the subordinate staff to coach them up in the various activities of the Department.

V. S. HABBU,
District Agricultural Officer,
North Kanara, Karwar.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) Multiplication and distribution of improved strains of Mugad and Kumta strains.

(2) Distribution of manure mixture.

(3) Rural compast—Digging of compost pits.

(4) Farmyard manure scheme—Digging and filling of farmyard manure pits by the improved method.

(5) Town compost scheme—Preparation of compost from town waste by the municipalities.

(6) Extension of area under the sweet potato scheme.

(7) Extension of area under the vegetable scheme.

(8) Colonisation scheme.

(9) Fencing scheme.

(10) Bandhara scheme.

(11) Koleroga Investigation scheme.

(12) Wells and tanks scheme.

V. S. HABBU,
District Agricultural Officer,
North Kanara, Karwar.

APPENDIX XXX

Summary of the work done under the District Agricultural Officer, Belgaum, for the year 1949-50

A. *Staff and Administration*

Shri S. F. Kotur, B. Ag., was in charge of the post of District Agricultural Officer up to the 19th June, 1949, and Shri B. H. Hullatti, B. Ag., relieved him on the 20th June, 1950, and took over charge of the office. Shri S. C. Javali, B. Sc. (Agri.), was the Assistant District Agricultural Officer up to the 2nd March, 1950, and Shri A. C. Kalyanimath, B. Sc. (Agri.) relieved him on the 3rd March, 1950, and took over charge of his post. Messrs S. C. Patil and B. B. Yaraguddi continued to hold charge of the posts of Agricultural Officers I/C Revenue Sub-Divisions Belgaum and Chikodi, respectively. The district staff continued to consist of 57 Agricultural Assistants.

B. *Season*

There were fairly good anti-monsoon showers during March and April followed by regular monsoon in time in June. Sowing of *kharif* crops was done in time and the germination was satisfactory. Rains in July favoured the growth and development of the crops. Sowing of cotton was delayed for a fortnight. During the month of August, dry spell prevailed with the result that the *kharif* crops received a setback. The sowing of *rabi* crops was done in time . The crops thrived well and yielded fairly well, except that of cotton, which was slightly affected by the adverse and unfavourable weather.

C. *"Grow More Food" Campaign*

(*a*) *Seed.*—(*i*) The details of the distribution of seeds under the P. W. R. Scheme No. 10 (18), (13) and of other seeds, including seeds selected from the Revenue *Godowns* are given below:—

Kind of seed.	Quantity stocked B. Mds.	Quantity distributed B. Mds.	Area covered acres.	Seed selected from the Rev. Godown B. Mds
Paddy	14,560	14,560	19,413	3,666
Wheat	60	60	120	—
Gram	309	309	772	215
Kharif jowar	105	105	1,365	10,015
Rabi jowar	525	525	7,140	9,075
Groundnut pods	80	80	80	—
Bajri	—	—	—	7,955
Maize	—	—	—	340

(*ii*) *Hot weather Food crops Campaign.*—An area of 253 acres under maize and 200 acres under Vaingan paddy were grown during hot-weather.

(*b*) *Manure distribution Scheme*:—Quantities of manures stocked, distributed and areas covered are as under:—

Kind of manure.	Quantity stocked. (tons)	Quantity distributed. (tons)	Area covered in acres
Manure-mixture	8,453	6,032	48,266
Amn. sulphate	1,264	284	4,260
Groundnut cake	1,680	1,212	6,060

Similarly the information regarding town-compost and rural-compost prepared and distributed is as under:—

Compost prepared in tons.	Compost distributed in tons	Area covered in acres.	Pits	
			dug	filled
Town compost				
2,675	1,800	720		
Rural compost				
22,500	22,500	9,000	15,294	10,450

(*c*) *Irrigation Schemes*: (*i*) During the year under report, 338 new wells were constructed and 53 old wells were repaired and the amounts of Rs. 1,20,641 and Rs. 1.025 were distributed as subsidy for the new wells and the old wells respectively. An amount of Rs. 6,83,905 and Rs. 91,654 was paid as tagavi loans for the new and the old wells respectively.

(*ii*) 55 bandhaaras were constructed for irrigating 2,133 acres and a subsidy of Rs. 2,203 was paid.

(*iii*) The district staff inspected 289 oil engines used for agricultural purpose for recommending crude-oil.

(*d*) *Vegetable Development Scheme.*—An area of 505 acres was extended under various vegetable crops and seeds worth Rs. 253 were distributed.

(*e*) *Horticultural work.*—139 gardens were visited by the subordinate staff and necessary technical advice was given on the spot. Arrangements were made to supply 629 fruit grafts from Government and local nurseries. Budding was undertaken on 362 mango trees.

(*f*) *Potato Extension, Scheme.*—3,500 B. Mds. seed was stocked and distributed during the *kharif* and *rabi* seasons sufficient for an area of 300 acres. 195 tons of cake-meal was distributed to the growers.

(*g*) *Sweet Potato Extension.*—An area of 4,527 acres was extended, as against 3,700 acres, in all the seasons. It is gratifying to note that an area of 827 acres was extended over the target allotment.

(*h*) *Pests and Diseases.*—(*a*) An area of 23,000 acres of paddy and 14,000 acres of kharif jowar was protected by dusting with 360 tons of Gammexane and Hexyclan in contiguous blocks. Besides, an area of 17,000 acres was protected by using 50 barrels of coal-tar and 300 tin-sheets.

(*b*) 112 lbs. of 5 per cent D. D. T. was used by the cultivators for dusting Mangohoppers and thus 300 trees were saved.

(*c*) 500 lbs. of sulphur dust was used by the cultivators for spraying Lime-sulphur-wash and crop on 100 acres was saved.

(*d*) 2½ tons of sulphur dust was distributed for treating jowar seed against Smut.

(*i*) *Propaganda and Publicity including Shows and Demonstrations.*—(*a*) 574 meetings of cultivators were held by the subordinate staff and all the facilities offered by Government were explained to them.

(*b*) Pamphlets showing yields of manured crops, application of artificial manures, protection of crops, etc., were published in the local newspapers from time to time and also, were broadcast on Radio.

(c) A District Show was held at Nandgad in the Khanapur taluka at the time of the 12th All India Bee Keepers Conference, inagurated by the Honourable Minister for Finance. Government of Bombay, and was a grand success.

(d) 190 demonstrations were held on the Agricultural Demonstration Centres, wherein standing crops of improved strains, manured plots, composting, grasshopper control, etc., were demonstrated.

D. *Agricultural Demonstration Centres*

There were 16 Agricultural Demonstration Centres in this district and proposals for 6 fresh additional centres were submitted to the Director of Agriculture.

E. *Miscellaneous activities*

(1) Tree Planting Day and Week.—During the tree planting Day and Week 26,000 seeds and seedlings were got planted of which 50 per cent survived.

(2) Tagavi loan applications for Land Improvement.—906 applications for tagavi loan for land improvement were disposed of, after inspection of the site, estimation of the cost, feasibility of the work, etc.

(3) Ameliorative Measures to Backward Class Cultivators.—Of the amount of Rs. 326 provided for the purpose, vegetable seeds worth Rs. 53 were supplied free of cost to 19 cultivators, Rs. 57 were granted for supply of an iron plough to a group of 6 cultivators and Rs. 196 were granted for supply of 36 mango and 36 chikoo grafts to 40 cultivators.

B. H. HULLATTI,
District Agricultural Officer,
Belgaum.

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PROGRAMME OF WORK FOR THE YEAR 1950-51

The following will be the items of work to be undertaken:—

Name of the Scheme	Quantity to be stocked.	Area to be covered in acres.
1. *Seed Scheme*—		
(*a*) Paddy	32,027 B mds.	42,770
(*b*) *Rabi* jowar	1,321 „	13,220
(*c*) Wheat	200 „	400
(*d*) Gram	2,340 „	4,680
(*e*) Groundnut	225 „	225
2. *Manure Schemes*—		
(*a*) Manure mixture ...	4,666 to	,7 8
(*b*) Groundnut cake ...	1,500 „	7,500
(*c*) Sulphate of Amn. ...	1,200 „	18,000
(*d*) Rural compost ...	12,000 Pits	8,000
(*e*) Improvement of farm-yard manure.	33,000 „ 480 Villages	16,800
(*f*) Town compost ...	13,300 tons	2,660
(*g*) Potato manure mixture...	36	105
3. *Crop Protection*—		
(*a*) Jowar Smut (Sulphur): ...	6,720 lb.	3,00,000
(*b*) Grasshoppers on paddy and jowar (Gammexane and Hexyclan).	335 tons	75,000
4. *Irrigation Schemes*—		
(*a*) Construction of new wells....	350	1,650
(*b*) Improvement of old wells....	125	

4. *Extension of Cultivation of Other Crops*:—

	Quantity to be stocked.	Area to be covered in acres.
(*a*) Extension of sweet potato—		
Kharif ...		850
Rabi ...		150
(*b*) Vegetable Development.		400
(*c*) Potato extension.		
Kharif ...	7,000 mds.	700
Rabi ...	3,000 „	300

B. H. HULLATTI,
District Agricultural Officer,
Belgaum.

Appendix XXXI

Summary of the work done under the District Agricultural Officer, Bijapur, for the year 1949-50

A. *Staff and Administration*

Shri B. H. Hullatti held charge of the post of District Agricultural Officer, Bijapur, up to the 19th June, 1949. Afterwards he was transferred to Belgaum and Shri S. F. Kotur took over charge of the post of District Agricultural Officer, Bijapur.

The following district staff was working in the district:—

	Sanctioned strength.	On duty.	Remarks.
1. District Agricultural Officer, Bijapur.	1	1	
2. Assistant District Agricultural Officer.	1	1	
3. Agricultural Officer I/C Lift Irrigation Schemes.	1	1	
4. Agricultural Officers I/C of Revenue Sub-Division.	3	3	
5. Agricultural Officer for Special work.	1	1	
6. Agricultural Assistants II Grade.	25	24	1 vacant
7. Agricultural Assistants III Grade.	34	32	2 vacant

B. *Season*

The rainfall received during the year under report was normal, but the intensity was most irregular. Only light anti-monsoon showers were received during the months of April and May, 1949, followed by regular monsoon which commenced during the 2nd fortnight of June with varying amount of rainfall (6″ to 8″ total) till the 2nd fortnight of September, when torrential rainfall amounting to 10″ to 12″ was received during a short period of a fortnight or so. The anti-monsoon showers were rather inadequate and preparatory tillage operations could not be carried out completely in many parts of the district. Sowing of *kharif* crops such as jowar, bajri, groundnut, etc., was undertaken in good time with the commencement of monsoon in favoured areas. Timely weeding and interculturings were also carried out. The *kharif* sown crops developed fairly well till the middle of September, when the sudden heavy rainfall received during the 2nd fortnight of September and onwards, however, damaged all the sown crops,

particularly bajri and groundnut. Pollination was retarded in the case of bajri due to washing of flowers, with a result that grain formation was very poor and thus affected the yields thereby. The developed pods in case of groundnut were observed regerminated and also rotten in the soil due to excess of moisture. The damage in each of these cases may be estimated to be from 20 to 25 per cent.

The sowing of *rabi* crops, such as jowar, wheat, gram, etc., was much delayed due to inaccessable nature of the soil for a pretty long time and sowing of these crops was commenced from the 2nd fortnight of October.

In general, the season for the year of 1949-50 may be characterised as below normal, due to inadequate rainfall in the beginning followed by sudden heavy rains during September and October and unfavourable weather conditions prevailed during the month of January, 1950, with a result that the crop yields were below normal.

C. *"Grow More Food" Campaign*

(*a*) *Seeds.*—(*i*) Distribution of improved seeds.

S. No.	Item.	Generation.	Target fixed. B. mds.	Area to be covered. Acres.	Quantity of seed stocked B. mds.	Quantity of seed distributed.	Area covered. Acres.	Addl. yield estimated. B. mds.
1	2	3	4	5	6	7	8	9
1	Rabi-jawar ..	II	21- 0	2,63,125	·160-60	160 60	139,930	87,930
1	Rabi-jawar M-35-1	III	625-00		1 781-40	173-40	...	...
		IV	12,500- 0		11,358-40	6,941-20		
			13,156 00		13,245-60	8,781-40		
2	Jaya wheat...	II	50 00	60	27-37	27-37	510	510
		III	250-00		N-4 82-20	66-00		
			300-00		319-57	255-00		
	Chaffa g m	II	19-00	5,928	83-40	83-40	8	...
		III	95-00		85-34	83-34	811	712
		IV	475-00		193-67	189-48		...
		V	2,375-00		...	...		...
			2,964-00		359-61	356 42		

(2) Besides these improved seeds of groundnut, viz., Pandicheri-8 and Spanish Peanut improved were distributed as under:—

Item.		Total Quantity stocked and distributed lb.
Pandicheri	...	1,645-10
Spanish Peanut improved	...	1,89[illegible]-18

A regular scheme was undertaken during the period under report.

(3) Paddy.—There was no regular scheme in regard to paddy distribution in this district. However, improved strains of paddy (100 bags) were distributed among the cultivators during the period under report.

(4) Hot Weather Foodcrops Campaign.—Intensive propaganda was made to grow hot weather foodcrops wherever possible. With a view to encourage the cultivators to raise these crops a subsidy of Rs. 15 per acre as sanctioned by Government was paid to those who sold 1 maund of grain per acre. The progress achieved during the period under report is as under:—

No. of acres put under hot weather foodcrops for which subsidy was paid.	Amount of subsidy paid.
970 acres	Rs. 14,550

(*b*) *Manures.*—

(*i*) *Groundnut cake.*—

Target fixed (tons)	Quantity purchased and stocked (tons)	Quantity distributed (tons)
1,500	1,956-17-2-2[illegible]	1,965-17-2-28

Besides this, a quantity of 297-15-2-2 tons of groundnut cake was distributed for cattle feeding in the district.

(*ii*) *Manure mixture.*—

Target fixed (tons)	Quantity purchased and stocked (tons)	Quantity distributed (tons)
508	565-2-3-16	510-16-1-15

(*iii*) *Sulphate of ammonia.*—A quantity of 32 tons was stocked and distributed to the irrigated foodcrops and vegetables.

(*iv*) *Rural compost.*—The target fixed for the district was 18,000 pits to be dug and filled. The work achieved was, 9,887

pits dug and filled and compost manure obtained therefrom was 32,940 tons to cover an area of 10,980 acres. The additional production estimated thereby was 6,940 B. Mds.

(*v*) *Town compost.*—Of the 13 Municipalities, only 12 have taken to compost making with town refuse. The target fixed and the work achieved are as under:—

Target	Total quantity of compost prepared	Total quantity sold
(tons)	(tons)	(tons)
8,160	3,700	1,343

(*c*) *Irrigation*—

(*i*) The scheme was transferred to the District Rural Development Board, Bijapur, since 1947-48. The progress of the scheme is as under:—

No. of applications received.	No. of applications disposed.	No. of wells constructed.	No of wells repaireds.	Subsidy paid, Rs.
1,200	488	312	126	117,262

(*ii*) Other works such as tanks and bandharas were under the executive control of the Revenue Department.

(*iii*) *Lift Irrigation Schemes.*—Of the seven schemes, only two viz. at Korti and Shivayogmandir were functioning and the remaining 5 viz. at Doddihal, Baluti, Rolli, Haveli and Anagwadi were not in operation. The target area to be irrigated and the actual area brought under irrigation under Korti and Shivayogmandir Schemes are as under:—

Target (acres)	Area actually irrigated (acres)	Place.	Remarks.
1,772	1023-19	Korti	Due to the restricted pumping capacity it was difficult to reach the target. Further, due to ups and downs and cut-up nature of the land and incomplete construction at places the actually irrigated area was much reduced.
1,328	131-20	Shivayogmandir	

(*d*) *Propaganda and publicity including shows.*—Intensive propaganda was carried out by the Departmental staff by holding 1,538 meetings in their respective jurisdictions, regarding advocating dry farming methods, use of improved seeds and manures, insecticides and fungicides to control plant pests and diseases (dusting of gammexane against grasshopper pest and treating of jowar seed with sulphur dust against smut), etc.,

Leaflets regarding use of sulphur dust for treating jowar seed with sulphur dust against smut disease and use of gammexane to control grasshopper pest and 2,010 booklets regarding Grow More Food crops, extension of area under sweet potato, preparation of compost etc., published in regional languages by Government, were freely distributed among the cultivators.

Nine Agricultural Shows were arranged in the district. In each of them, separate stalls were arranged to exhibit best samples of improved seeds, manures, implements and applicances. The cultivators, who visited each of them, were explained the use and advantage of the samples exhibited. About 50,000 visitors attended all these shows. It is gratifying to note that due to the best samples exhibited at the show held in Bijapur at the time of the Shri Siddeshwar Fair by the Agricultural Department, the Shri Shiddeshwar Samstha was pleased to award a *Gold Medal* to the Agricultural Department.

(*e*) *Insect pests and plant diseases.*—(*i*) *Grasshopper Campaign.*—The area covered and the total quantity of Gammexane utilised for dusting jowar crop against grasshopper are detailed below:—

Area covered acres.	Gammexane used lb.
9,514	2,05,943

(*ii*) *Application of sulphur dust to jowar seed against smut.*—14,267 lbs. of sulphur dust was supplied to cultivators for dusting jowar seed against smut, to cover an area of 5,70,624 acres.

(*f*) *Special scheme, if any.*—(*a*) Vegetable Development and Sweet Potato Extension Schemes.—The target fixed and the work achieved are as under:—

	(Target acres)	Area covered (acres.)
Vegetable	... 450	1,238-38
Sweet Potato	... 1,000	610-35

Free supply of vegetable seeds and manures was made for Schools and College compounds. Necessary quantities of vegetable seeds were also supplied to the owners of bungalows compounds and cultivators on indent.

The cultivators were supplied with sweet potato vines at the concession rate of Rs. 20 per acre of the extended area. The total amount of Rs. 4,912 was paid to the cultivators as subsidy for the extended area of 425 acres and 12 gunthas during the period under report.

(*b*) *Potato Scheme.*—There was no regular scheme for the extension of potato crop in this district as the crop is not grown here.

D. *Agricultural Demonstration Centres*

There were 11 Agricultural Demonstration Centres working in this district, of which two, viz. Bilgi and Huvinhippargi were shifted to the new sites namely, Anagwadi and Gosangi, respectively, as they had completed their 5 years' working. A fresh modified proposal for shifting of Ballolli Agricultural Demonstration Centre to Chadchan, instead of to Atharga,was submitted to Government and approval to the same was awaited.

E. *Miscellaneous activities*

(*i*) *Horticulture.*—1,263 fruit plants like mango, chiku grafts, guava plants, lemon seedlings, etc., were supplied to the cultivators.

(*ii*) *Tree Planting.*—Tree planting weeks were observed and about 24,000 plants were planted in this district.

(*iii*) *Gram Sudhar Saptaha.*—Gram Sudhar Saptah was observed in the district from the 2nd October, 1949, to the 8th October, 1949. During this Saptah, regular meetings were conducted by the departmental staff in villages they visited and demonstration with regard to improvement of farmyard manure and digging of compost pits were arranged. The work achieved is as follows:

Farmyard M. pits dug and filled.	Compost pits dug and filled.
256	168

(*iv*) The District Agricultural Officer attended various meetings of the District Rural Development Board, Wilson Anti-Famine Institute, Post War Reconstruction Planning, etc., and also rendered technical advice on agricultural matters to some of the District Committees.

S. F. KOTUR,
District Agricultural Officer,
Bijapur.

PROGRAMME OF WORK FOR THE YEAR 1950-51

1. Purchase, distribution and multiplying of improved seeds.
2. Purchase and distribution of manures, such as groundnut cake and manure mixture.
3. Inspection of rural compost work.
4. To dispose of applications for well subsidy for construction of new wells and improvement of old wells.
5. To supervise lift irrigation schemes.
6. Propaganda for 'Grow More Foodcrops' Jute and cotton.
7. Propaganda for eradication of hariyali with tractor ploughing, cultivation of waste lands, etc., and to dispose of applications for tractor ploughing received from the cultivators.
8. To supervise the work of controlling grasshopper pest and also to stock sufficient quantity of Gammexane for the purpose, and sulphur dust for treating jowar seed against smut.
9. Propaganda for extension of vegetable and sweet-potato cultivation.
10. Inspection of Agricultural Demonstration Centres.
11. Arranging demonstrations and shows.
12. Attending Rural Development Board Meetings and other district Committee meetings.

S. F. KOTUR,
District Agricultural Officer,
Bijapur.

APPENDIX XXXII

Summary of the work done under the District Agricultural Officer, Dharwar, for the year 1949-50

A. *Staff and administration*

During the year under report, Shri B. B. Yeligar, B. Ag., continued to hold the post of the District Agricultural Officer, Dharwar. The total strength of the staff consists of 1 Assistant District Agricultural Officer at Head-Quarters, 5 Agricultural Officers, and 30 Agricultural Assistants. All the agricultural

activities were carried out through four Revenue Sub-divisions, each of which was in charge of one Agricultural Officer. Each taluka or mahal in each Sub-division is further divided into five circles in order to facilitate the spread of agricultural activities.

B. *Season*

The ante-monsoon rains during the months of April and May, 1949, were favourable throughout the district. They encouraged preparatory tillage operation for kharif crops besides facilitating the sowing of paddy. Regular monsoon, though commenced in time, as found feeble in the 1st half of June. Only light and well distributed showers occurred during the period. These showers helped the sowing of hill-millets and other kharif crops and also preparing the lands. From the middle of June till the middle of July, practically there were no rains. As a result of this, the sowing of groundnut cake and planting of potato were held up in many parts. The young crop of paddy also suffered due to inadequate soil moisture. But fortunately, well distributed rains received during the third week of July improved the situation throughout the district to a great extent, except Malanad, where the showers were not heavy enough to impound water in paddy fields. As such the "Hodata" operations could not be given to paddy in many places. During the month of August again dry spell prevailed due to which the growth of the standing crops retarded. Afterwards, however, the rainfall conditions till the close of September were favourable throughout the district for all the crops, except paddy. The requirement of paddy for standing water could not be satisfied. With these rains cotton sowings were completed and the lands for rabi sowing were also prepared. The 1st half of October went dry. Due to this the paddy crop and other standing crops in less remtative soils showed signs of withering; while in the second half there are oppertune rains, which promoted the development of all crops besides encouraging the rabi sowings. In the later half of November, there were some sporadic light showers, which interferred with the harvesting of spreading type of groundnut. From December onwards the rains completely ceased and the cold weather prevailed which promoted the growth of all rabi crops.

On the whole, in spite of repeated breaks in the rains, the seasonal conditions for all the kharif and rabi crops, except

paddy, have proved better than those of 1948-49 seasons. The anna valuation of the principal crops were as follows:—

Paddy	...	7-8 annas.
Kharif jowar	...	8-10 annas.
Groundnut	...	7-8 annas.
Chillies	...	6-8 annas.
Cotton	...	9-10 annas.

C. *'Grow More Food' Campaign*

(*a*) *Improved seed schemes.*—Schemes Nos. 6, 10, 13 were in operation, during the year under report. A quantity of 28,715 B. Mds. of improved paddy seed of Mugad, Antersal and Y-4 strains, 360 B. Mds. of improved Chaffa gram, 192 B. Mds. of wheat 808 strain, 207 B. Mds. of kharif jowar and 204 B. Mds. of rabi jowar were distributed and the area covered under each of these seeds were 38,286, 960, 385, 4,140 and 4,080 acres respectively.

(*b*) *Manures.*—(*i*) Groundnut cake, manure mixture and sulphate of ammonia were distributed to the extent of 1,710, 1,706 and 36 tons, respectively. The said manures were used for manuring paddy, jowar and other foodcrops on an area of 14,851, 17,981 and 1,260 acres, respectively. Over and above this about 80 tons of cake distributed for manuring potato crop.

(*ii*) *Rural compost.*—During the year under report, 32,349 pits were dug and 31,313 pits were filled in. Of the pits filled, about 11,160 pits were emptied yieldings 27,900 tons of ripe compost. Such compost was applied on an area of 11,160 acres of foodcrops, such as paddy, jowar and bajri and vegetables.

(*iii*) *Town compost.*—All the 13 Municipalities had taken up the work of preparation compost from townwaste by scientific methods. The total quantity of compost obtained was 4,802 tons and a quantity of 2,181 tons was distributed for applying to the foodcrops to cover an area of 1,090 acres.

(*iv*) *Improvement of farmyard manure.*—This particular work was taken in 400 selected villages in this district during the year under report. The progress achieved during the year towards this and comes to 185 villages. The pits so improved, on an average taking 80 pits improved per village, work out at 14,800 pits. Thus the manure prepared from the above pits works out 37,000 tons. All such manure was used for growing foodcrops.

(c) *Irrigation.*—14 new wells were constructed and 8 old wells were repaired during the year under report. An amount of subsidy Rs. 6,099 and tagai of Rs. 1,75,097 were paid to the cultivators during the said year.

(b) *Propaganda and publicity including shows.*—(*i*) As usual, intensive propaganda was carried out for increasing the food production by adopting improved methods advocated by the Department with a view to creating a healthy spirit of competition amongst the cultivators in stepping up per acre yield of steple crops. Government set aside an amount of Rs. 150 for each taluka or mahal for awarding prizes to the cultivators. An amout of Rs. 300 has been awarded for the purpose to the cultivators during the year under report. In all 19 growers competed for these prizes. The highest yield of paddy recorded was 4,448 lbs. per acre.

(*ii*) With a view of enlightening the public as to how the improvement can be brought into practice as also to keep them informed of the facilities granted by Government to step up food production, about 35 articles were published in the local news papers. In addition, about 2,000 leaflets on crop production 3,000 on compost making, 2,000 on agricultural improvements, 3,000 on tree planting, 5,000 on sulphur dusting and 6,000 on vegetable cultivation were published and distributed amongst the literate cultivators.

(*iii*) During the year under report one big District Agricultural Exhibition at Hosaritti and the other Industrial and Agricultural Exhibition at Dharwar were held. Over and above 8 taluka agricultural shows and 18 small Agricultural Shows on Agricultural Demonstration Centres were also organised, besides a number of standing crops demonstrations. Large number of cultivators took the advantage of these shows and demonstrations.

It may also be mentioned here that the District Agricultural Officer, Dharwar, gave radio talks on "Food first and foremost and the ways in which the farmer should co-operate" and "Manures and Seeds, Compost making and Vana-Mahotsava" from the All India Radio Stations, Dharwar and Bombay.

(*e*) *Insect pests and plant diseases.*—(*i*) *Grasshopper attack.*—The attack was severe on kharif jowar crop on an area of about 26,000 acres, of which preventive measures were adopted on an area of 11,465 acres by dusting 10 per cent Gammexane and Hexyclan. For dusting the above said area 1,72,050 lbs. of insecticide was used.

(*ii*) *Sulphur dusting against jowar smut.*—Jowar seed sufficient to cover 3,50,000 acres was treated with sulphur dust using 7,840 lbs. sulphur against grain smut of jowar.

(*iii*) *Trouble of field rats.*—285 lbs. of Barium Carbonate was distributed as a poision bait against the trouble of field rats to jowar crop during the year at reasonable.

(*f*) *Special Schemes.*—(*i*) *Vegetable Development Scheme.*—The extension of vegetable area has exceeded the target figures of 500 acres allotted to this district. The additional area covered comes to 962 acres.

(*ii*) *Sweet potato extension scheme.*—Similarly, the extension of sweet potato crop was taken up during the year under report. An area of 230 acres was extended against the target of 300 acres.

(*iii*) *Potato Scheme.*—The Department arranged to supply 3,444 B. Mds. of Poona seed and distributed it to cover 688 acres. In addition to this, about 2,000 B. Mds. of Banglore seed was imported by local merchants and distributed to cover another 500 acres. Thus the total area extended was 1,188 acres.

(*iv*) *Extension and organisation of fruit cultivation.*—The following number of different kinds of fruit plants and grafts were distributed during the year under report:—

		No.
1. Mango grafts	...	5,350
2. Basari banana	...	2,000
3. Lemon	...	4,000
4. Mosambi	...	300
5. Chiku plants	...	200
6. Coconut	...	450
7. Guava	...	10,000
Total	...	22,300

D. *Agricultural Demonstration Centres*

In all, 16 Agricultural Demonstration Centres were operating in the district and the working of these centres was satisfactory. Of these centres, 3 had completed their 5 year plan and hence they were shifted to new sites. Proposals were submitted for starting another 5 more Agricultural Demonstration Centres in the first instant at the rate of 2 Agricultural Demonstration Centres per taluka.

E. *Well Irrigation Centre*

The Well Irrigation Centre at Ranebennur ceased its working during this year as per orders of the Director of Agriculture, Bombay State, Poona.

F. *Experiments*

Crop cutting experiments on paddy to assess the increased yield by the application of manure mixure were undertaken in each paddy growing talukas in 20 villages. The results obtained were encouraging; 30 to 35 per cent increased yield was recorded. Similarly improved strains of kulti were also undertaken and the results sent to the Deputy Director of Agriculture (crop Research).

G. *Miscellaneous Activities*

The District Agricultural Officer worked very hard in various capacities on different committees during the year under report as under:—

(*a*) Joint Secretary, District Rural Development Board, Dharwar.

(*b*) Member of the Amrut Mahal Cattle Breeding Committee.

(*c*) Member of the District Adult Education Committee.

(*d*) Member of the District Land Improvement Committee.

(*e*) Member of the District Minor Irrigation Committee.

Besides these committees, the District Agricultural Officer and the Assistant District Agricultural Officer engaged four Social Workers Training Classes, organised during the year by the Rural Development Board, Dharwar.

B. B. YELIGAR,
District Agricultural Officer,
Dharwar.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(*a*) Multiplication and distribution of improved seeds of paddy jowar, wheat and gram as per target fixed.

(*b*) Storage and distribution of groundnut cake, manure mixture, sulphate of ammonia, etc., as per target allotted.

(*c*) Continuance of the Rural and Town Compost Scheme and to achieve the target allotted. Similarly, work regarding improvement of farmyard manures in villages will be continued.

(*d*) The scheme for construction of new wells and tanks and repairs to old ones to be continued as per plan.

(*e*) Work towards the extension of vegetables, potato and sweet potato to be continued as per plan.

(*f*) Pests and diseases control on crops by the treatment of Gammexane on Wingless grasshopper and treating jowar seed with sulphur dust against jowar smut, etc., to be continued.

(*g*) Working of Agricultural Demonstration Centres to be continued as usual.

(*h*) Propaganda, shows and demonstrations to be continued as usual.

B. B. YELIGAR,
District Agricultural Officer,
Dharwar.

APPENDIX XXXIII

Summary of the Work done under the District Agricultural Officer, Surat, for the year 1949-50

A. *Staff and Administration*

Shri M. K. Desai continued to hold charge of the post of District Agricultural Officer, Surat.

B. *Season*

Regular monsoon commenced from the first week of July and continued with heavy and light falls at intervals of varying intensity throughout the district till the end of the third week of August. There was a break for about a week or so at the end of August, 1949. The rainfall ranging from 32″ to 93″ was received in different talukas of the district. The rainfall on the whole, was well distributed and helped the growth of paddy, jowar and cotton crops to a great extent. The heavy and continuous rains received during the third week of September, damaged early paddy and bajri crops to some extent. These late rains. however, benefitted *rabi* crops, viz., wheat, wal, etc.

C. *'Grow More Food' Campaign*

(*a*) *Seed Supply.*—The scheme for multiplication and distribution of Z-31 paddy seed was continued and was in the III stage

of multiplication, during the period under report. The improved seed distributed was as under, under the various stages:—

Stage.			Quantity distributed
II	...	...	18 B. Mds.
III	...	...	21 B. Mds.

877 B. Mds. of Paddy Z-31 was secured locally and 4,631 B. Mds. was procured from the Thana district for distribution in year 1950-51.

The scheme will be further continued in the year 1950-51.

The scheme for multiplication and distribution of Niphad-4 wheat seed was started during this year and 15 B. Mds. of nuclear seed was supplied to selected growers. The resultant seed will be procured and distributed in the year 1950-51.

The following general seeds were distributed during the period under report:—

Kind of seed.		Quantity B. Mds
Paddy	...	39,912
Jowar	...	958
Maize	...	200
Wheat	...	15,000
Bajri	...	5
	Total ...	56,075

(*b*) *Manure.*—2,575 tons of groundnut cake was supplied to the cultivators at a subsidised rate for manuring 12,875 acres under foodcrops during the *kharif* season of 1949-50. The target allotment for 1950-51 is 2,300 tons. A quantity of 495 tons of manure mixture was distributed for manuring an area of 3,960 acres mainly under paddy crop during the *kharif* season of 1949-50. A target of 1,263 tons of manure mixture is fixed for 1950-51 year for this district. Besides, 252 tons of sulphate of ammonia was distributed to the cultivators for manuring all crops at economic cost.

16,564 compost pits were dug, 9,794 were filled and 603 were emptied during the year 1949-50 against a target allotment of 10,000 pits. The ripe compost obtained from the emptied pits was applied to 603 acres of land. A target of 10,000 compost pits is fixed for the year 1950-51 for this district.

The quantity of ripe town compost produced during 1949-50 was 5,188 tons, and of this quantity, 4,137 tons of town compost was applied to 827 acres of land. A target of 21,030 tons of town

compost is fixed for the year 1950-51. Under the scheme for improvement of farmyard manure, 136 villages had taken up the scheme. 579 new pits were dug and 512 pits were improved against the target of 450 villages for 1949-50. It is proposed to undertake this scheme in 450 villages during the year 1950-51.

700 wagons (14,000 tons) of cattle dung manure from Bombay Suburban district was supplied to the cultivators of this district during the period under report, which was applied to 2,800 acres of land.

(c) *Well Scheme.*—237 new wells were constructed and 67 old wells were repaired for which subsidy of Rs. 1,00,048 and Rs. 13,552 was granted. Tagavi loans of Rs. 3,30,500 and Rs. 86,407 were sanctioned for 156 new wells and 47 old wells during the period under report.

Three *kacha* bandharas were constructed, which irrigated an area of 52 acres.

An area of 152 acres was brought under lift irrigation, during the period under report.

(d) *Vegetable and fruit extension.*—The area brought under vegetables was 1,615 acres and under sweet potato, 239 acres. A special target of 500 acres under banana was allotted. The area extended under the crop was 700 acres. The targets for 1950-51 are 800 acres under vegetables, 150 acres under sweet potatoes and 500 acres under banana.

(e) *District trials.*—The following trials were carried out in the district:—

(1) Trials for ascertaining the increase in the yield due to application of farmyard manure and town compost manure, were carried out in the district. The crop selected for the trials was *kharif* jowar. Five villages were selected within a radius of 5 miles from the town compost depot and in each village two cultivators were selected.

(2) Comparative performance of groundnut cake, manure mixture and no manure on paddy crop. Seven such trial plots were arranged during the year under report.

(3) Comparative performance of rural compost, farmyard manure and no manure on paddy and jowar crops.

(f) *Implements.*—35 iron ploughs and 350 Allan gandhi hoes were distributed to the cultivators during the period under report.

(*g*) *Plant Protection.*—954 lb. of sulphur dust was distributed to the cultivators for treating jowar seed against smut. Insecticides, viz., Pyrocolloid, DDT, Gammexane, etc., were made available to the cultivators for controlling pests on paddy, vegetables and mango trees. About 19,000 mango trees were treated with DDT for controlling mangohoppers.

This work will be continued in the year 1950-51.

D. *Agricultural Demonstration Centres*

There were 12 Agricultural Demonstration Centres in the district. The Agricultural Assistants in charge of Agricultural Demonstration Centres moved in the surrounding villages and did propaganda for improved seeds, implements, use of manures, preparation of compost, improvement of farmyard manure, etc. The improvements advocated by the Department were shown to the cultivators by holding demonstrations on the centres. The Assistants also distributed improved seeds, manures, implements, insecticides and fungicides to the cultivators of the surrounding villages. The implements stocked at the depots were also given on hire to the cultivators.

It is proposed to start two Agricultural Demonstration Centres in each taluka of the district in the year 1950-51.

E. *Extension of fibre crops*

The varieties of jute, viz., *Corchorus Capsularies* and *Corchorus Olitorius* were tried at four different places in the district. The jute crop progressed fairly well attaining a height of 5′ to 6′. It is proposed to extend the area under jute and mesta by 50 and 1,000 acres, respectively, during 1950-51.

F. *Miscellaneous Activities*

(1) *Agricultural Show at Mandvi.*—An Agricultural and Cattle show was organised at Sindhavi village, taluka Mandvi, on the 21st January, 1950. The Hon'ble Minister for Forests and Agriculture declared the show open and visited different stalls. The Agricultural and Cattle show was very successful and nearly 25,000 cultivators took advantage of the show.

(2) *Training Classes for rural workers.*—Four training classes were organised at Kathor, Ajrai, Maroli and Bilpudi.

In all, 100 rural workers were trained in four classes.

M. K. DESAI,
District Agricultural Officer,
Surat.

Appendix XXXIV

Summary of the work done under the District Agricultural Officer, Broach, for the year 1949-50

A. *Staff and Administration*

Shri L. N. Patel continued to hold charge of the post of District Agricultural Officer, Broach during the year under report.

The structure of the district staff of the Agricultural Department in the Broach District remained *status quo* with the changes that two posts of Agricultural Officers, Incharge Jambusar and Rajpipla Revenue Sub-divisions were filled up and three posts of Agricultural Assistants were added for the Lift Irrigation Scheme and Plant Protection work.

B. *Season*

Regular monsoon commenced late by about a fortnight than the normal period, but the distribution of rainfall was satisfactory and kharif and rabi crops, except rabi jowar and lang, progressed well and gave satisfactory outturn. In the case of rabi jowar sowing was delayed due to late rains and the crop was affected by aphids to a considerable extent, especially in the Bhatha land. Further tobacco and vegetable crops were damaged especially in the Bhatha land, and cotton crop was damaged to some extent in other part of the district due to frost in the second week of February. Except this, there were no special features of the season under report.

C. *Grow More Food Campaign*

(*a*) *Seeds.*—(1) There was only one scheme, viz. multiplication and distribution of jowar No. 8 seed in the Broach district and the following quantities were distributed.

Satge of seed.	Quantity distributed B. Mds	Area covered Acres.
II	7-20	68
III	116-12½	878

(2) *Seed Supplied to the famine and scarcity area.*—Special arrangements were made to bring the following quantities of wheat seeds from Palanpur, Khandesh and Sindh and to

distribute the seeds by the Revenue Department with the help of the Agricultural Department.

	Quantity stocked. B. Mds.	Quantity Distributed. B. Mds.
Wheat Nandarbari	36,208·32	25,501·10
Wheat Palanpuri	17,808·27	2,532·17
Wheat Sindh	799·00	4·20

(*b*) *Manures.*—(1) Following quantities of manures were distributed during the period under report:—

	Quantity distributed Tons.	Area covered Acres.
(1) Groundnut cake	870½	4,140·0
(2) Manure mixture	78	624·0
(3) Sulphate of ammonia ...	48	720·0
(4) Sweet Potato	3½	47·0
(5) Superphosphate	5	100·0

(2) *Rural and town compost.*—(*i*) *Rural compost*—689 compost pits were dug and 458 pits were filled up during the period under report. Of the pits filled up, about 1,145 tons of manure was expected.

(*ii*) *Town compost*—Of the 5 Municipalities in the district, only the Broach Municipality undertook the preparation of compost on a large scale. The total production of town compost manure was 2,774 tons, of which, 1,280 tons was distributed during the period under report.

(*c*) *Irrigation.—Wells*—Under the well improvement scheme, 70 new wells were constructed and 90 old wells were repaired during the period under report.

(*d*) *Propaganda and publicity, including shows.*—Propaganda regarding improved seeds, viz. jowar B. P. 53, paddy K-184, wheat 224, wheat Niphad 4 and of manures, improved implements and insecticide, were carried on by the district staff and following quantities of each were supplied to the needy cultivators during the period under report.—

Seed.	Quantity supplied B. Mds.
(1) Wheat 224 ...	10-20
(2) Wheat Niphad 4 ...	25-35
(5) Salt paddy ...	50-00
(3) Paddy K-184 ...	60-20
(4) Paddy Z-31 ...	2-00
(6) Jowar B. P. 53 ...	20-00
(7) Castor S-20 ...	2-20
(8) Spanish peanut ...	7-20

Insecticides.

	Quantity supplied lb.	Ar a covered Acres.
(1) Sulphur dust for jowar smut	4,000	96,000
(2) Sulphur dust for mango trees	142	—
(3) Gammexane for insect pest	315	25

Implements.

Winnowing fans ... 7

No Agricultural shows regarding 'Grow More Food' Campaign were held, except demonstrations, on Agricultural Demonstration Centres and Officers' day and Farmer's week during the second week of January, 1950. Competitions were arranged for higher production of foodcrops and three prizes were given for the high yields.

(*e*) *Insect pests and plant diseases.*—Except Aphids and lang pod borer trouble, there was no trouble and Gammexane was utilised against Aphids trouble. The estimated percentage of damage was as under:—

(i) Lang pod borer trouble ... 20 to 25 per cent.

(*ii*) Aphid trouble on *rabi* jowar crop, specially in the Bhatha land ... 15 to 20 per cent.

(*f*) *Special schemes if any.*—(*i*) Vegetable Development *scheme.*—Arrangements were made to supply required vegetable seeds to the needy cultivators from reliable sources. Area extended under vegetable crop was 229 acres during the period under report.

(*ii*) *Sweet Potato scheme.*—Special arrangements were made to raise and multiply vines in the nursery and to supply these to the needy cultivators. The area extended during the period under report was 92 acres.

D. *Agricultural taluka Demonstration Centres*

There were six Agricultural Demonstration Centres in this district. No centre was shifted to a new site during the period under report. No Agricultural Demonstration centre was in existence in the merged area of the State of Rajpipla.

E. *Miscellaneous activities*

Information was collected for preparing cropping programmes and water managements under the Lift Irrigation Schemes by the staff appointed for Lift Irrigation Schemes. The work

of collecting and compiling information for the Gazeteer was undertaken. This was the special item for the district in addition to the other day to day routine work. The work of collecting and compiling information, on survey reports on farmyard manure, 'Grow More Food' and 'Post War Reconstruction Schemes' progress reports was also undertaken. Help was given in conducting Social Workers Training Classes and Rural Development Boards' work.

L. N. PATEL,
District Agricultural Officer,
Broach.

PROGRAMME OF WORK FOR THE YEAR 1950-51

Execution of various 'Grow More Food' schemes, the targets of which have already been fixed for 1950-51.

(1) Seed multiplication and distribution of jowar No. 8 scheme.
(2) Supply of groundnut cake, manure mixture for foodcrops.
(3) Supply of sulphate of ammonia for cotton and foodcrops.
(4) Supply of sweet potato mixture and superphosphate for foodcrops.
(5) Vegetable and sweet potato extension work.
(6) Preparing compost manure, rural and town and improvement on existing method of farmyard manure.
(7) Plant protection scheme.
(8) Inspection of new wells and repairs to old ones for grant of subsidy and crop and water management under Lift Irrigation Schemes.
(9) Extension of area under cotton and mesta.
(10) Making arrangements to supply of other improved seeds and improved implements according to the demand from cultivators.
(11) Supervision of crop cutting experiments and conducting Social Workers Training Classes.
(12) Holding demonstrations on Agricultural Demonstration Centres at various stages of the crop and on other cultural methods.

L. N. PATEL,
District Agricultural Officer,
Broach.

Appendix XXXV

Summary of the work done under the District Agricultural Officer, Panchmahals, Godhra, for the year 1949-50

A. *Staff and Administration*

Shri V. M. Majmudar continued to hold charge of the post of District Agricultural Officer, Panchmahals, throughout the year under report. The district staff consisted of three Agricultural Officers incharge Revenue Sub-divisions, eleven Agricultural Assistants incharge Talukas and Mahals and sixteen Agricultural Assistants incharge Agricultural Demonstration Centres and other Agricultural Circles.

B. *Season*

The rainfall was normal, viz., about 30 inches, with fare distribution and all the *kharif* crops fared well. *Rabi* crops also fared well as there was sufficient moisture in the soil due to rains in October, 1949.

C. *'Grow More Food' Campaign*

(*a*) *Seeds.*—(1) Sameri Maize seed Scheme—8,729 B. Mds. of sameri maize seed was distributed, covering an area of 34,916 acres.

(2) Niphad-4 Wheat Seed Scheme—314 B. Mds. of Niphad-4 wheat seed was distributed covering an area of 314 acres.

(3) Seed supply in famine and scarcity areas—No seed was supplied to famine or scarcity areas during the year.

(*b*) *Manures.*—(1) Groundnut cake distribution—3,312 tons of groundnut cake was distributed covering an area of 16,560 acres.

(2) Manure mixture distribution—90 tons of manure mixture was distributed covering an area of 720 acres under foodcrops.

(3) Sulphate of ammonia distribution—63 tons of sulphate of ammonia was distributed covering an area of 945 acres.

(4) Rural Compost Scheme—9,979 pits were dug and 5,611 pits were filled, with an estiamted production of 14,028 tons of manure which would cover an area of 2,806 acres.

(5) Town compost Scheme—The Godhra and Dohad Municipalities composted 50,100 cft. of refuse. Estimated production of ripe manure was 1,002 tons which would cover 201 acres.

(*c*) *Irrigation.*—128 new wells were constructed and 46 old wells were repaired, covering an area of about 600 acres under irrigation.

(*d*) *Propaganda and publicity, including shows.*—74 demonstrations were held on the Agricultural Demonstration Centres and 186 meetings of Taluka Development Boards and cultivators were held and attended by the staff for propaganda, etc. One District Agricultural and Cattle Show was organised at Jhalod under the auspicious of the District Rural Development Board and was precided by the Collector and Chairman, District Rural Development Board, Panchmahals, Godhra.

(*e*) *Insect Pests and Plant Diseases.*—There was no serious attack of any pests or diseases.

(*f*) *Special Schemes, if any.*—(1) Extension of vegetable cultivation—68-25 acres were extended under vegetable cultivation.

(2) Extension of sweet potato cultivation—28-37 acres were extended under sweet potato cultivation.

(3) Potato Scheme—This scheme was not in operation in this district.

D. *Agricultural Demonstration Centres*

Six Agricultural Demonstration Centres were working during the year.

E. *Miscellaneous Activities*

(1) *Tractor ploughing.*—Ten tractors were received by this district from the Mechanical Cultivation Engineer to Government and 237 acres were ploughed with them. A training class for local workers was organised to meet the demand of Tractor Drivers.

(2) Selection of general seeds—11,300 B. Mds. of maize, paddy, wheat, bajri, jowar and other minor cereals were selected for distribution for seed purposes in the *kharif* and *rabi* seasons.

(3) District Trials—21 trials of manures and new strains of Bavto, Kodra and Paddy were conducted.

(4) Despatch of groundnut cake to other districts. 8,653 tons of groundnut cake were despatched to other districts.

(5) Distribution of groundnut cake for feeding the cattle of scarcity areas—About 50 tons of groundnut cake was distributed for feeding cattle in the scarcity area of the Ahmedabad district.

V. M. MAJMUDAR,
District Agricultural Officer,
Panchmahals, Godhra.

PROGRAMME OF WORK FOR THE YEAR 1950-51

Name of the Scheme	*Target of work to be done.*
(1) Sameri Maize Scheme ...	33,330 B. Mds. of seed.
(2) Wheat Niphad-4 Scheme ...	1,240 B. Mds. of seed.
(3) Groundnut cake distribution. ...	1,350 tons of cake.
(4) Manure mixture distribution. ...	127 tons of manure mixture.
(5) Sulphate of Ammonia distribution. ...	80 tons of sulphate of ammonia.
(6) Compost pits ...	10,,000 pits to be dug.
(8) Town Compost Scheme ...	28,000 pits to be dug.
(7) Farmyard manure Scheme ...	2,000 pits of compost to be prepared.
(9) Extension of Vegetable cultivation. ...	100-0 Acres to be extended.
(10) Extension of sweet potato cultivation.	200-0 Acres to be extended.
(11) Construction of new wells.	300 wells to be constructed.
(12) Repairs to old wells ...	200 wells to be repaired.

V. M. MAJMUDAR,
District Agricultural Officer,
Panchmahals, Godhra.

APPENDIX XXXVI

Summary of the Work done under the District Agricultural Officer, Kaira, Nadiad, for the year 1949-50

A. *Staff and Administration*

Shri K. R. Patel was incharge of the post of District Agricultural Officer, Nadiad. The old Kaira district, consisting of 8 talukas was reorganised after the merger of the State areas in the district. Thus, the district has consisted of 12 talukas including one mahal. In each taluka, excepting Petlad, Bhadran, Cambay, Balasinor and Attarsumba, there are five agricultural circles incharge of Agricultural Assistants, while in the remaining talukas there are two Agricultural Assistants. The district staff consisted one Assistant District Agricultural Officer, two Agricultural Officers incharge Revenue Sub-division and 36 Agricultural Assistants.

B. *Season*

Kharif.—Rains were received during July, August and September. These rains were beneficial to almost all crops, like bajri, kodra, cotton, etc. The growth and yields of the crops were satisfactory and the season was normal.

Rabi.—Kharif crops were harvested during November. Sowing of irrigated wheat and planting of potatoes were started during that month. Root rot disease in cotton was reported at some places and attack of wingless grasshoppers on wheat in Cambay taluka was reported. The season was normal.

C. *'Grow More Food' Campaign*

(*a*) *Seeds.*—(1) Scheme for Multiplication and Distribution of Bajri No. 207—3,475 B. Mds. of bajri seed was purchased, of which, 547 B. Mds. were distributed to cover an area of 5,470 acres. Due to natural spread, about 50,000 acres under this bajri were covered.

(2) Distribution of Niphad-4 wheat seed—About 112 B. Mds. of wheat seed was purchased, of which, 180 B. Mds. of seed was distributed to cover an area of 108 acres.

(3) Hot Weather Crops Campaign—Subsidy of Rs. 37,410-13-0 was paid to the cultivators for growing summer bajri on 2,494 acres at the rate of Rs. 15 per acre.

(*b*) *Manures.*—(1) Groundnut cake—About 4,778 tons of groundnut cake was distributed for foodcrops, which covered an area of about 23,890 acres.

(2) Manure mixture—98 tons of manure mixture was distributed for foodcrops, which covered an area of about 784 acres.

(3) Sulphate of ammonia—About 595 tons of Sulphate of Ammonia was distributed for foodcrops, which covered an area of 8,925 acres.

(4) Rural Compost Scheme.—936 pits were dug, of which 639 pits were filled in with farm refuse. About 253 tons of this manure was distributed which covered an area of 51 acres.

(5) Town Compost Scheme—About 3,140 tons of Municipal compost was prepared, of which 2,053 tons of ripe manure was distributed, which covered an area of 411 acres.

(*c*) *Irrigation.*—(1) Scheme for construction of new wells and repairs to old ones.—About 185 new wells were constructed and 80 old wells were repaired. Estimated area that will come under irrigation would be 800 acres.

(2) Ratanpur Lift Irrigation Scheme—The scheme was started in this year. About 35 acres of *kharif* crops, like paddy, and about 62 acres and 9 gunthas of *rabi* crop, like wheat, were brought under irrigation.

(*d*) *Propaganda and Publicity including Shows.*—Propaganda of improved seeds, manures and implements was made by holding meetings and demonstrations and shows. About 50 meetings of cultivators were held and 8 demonstrations were organised. One grand Agricultural and Cattle Show was also held during February, 1950, at Mehmedabad and different activities of the Agricultural Department with regard to 'Grow More Food' schemes were exhibited.

(*e*) *Insect pests and plant diseases.*—Attack of wingless grasshoppers on wheat in the Cambay taluka was reported and the same was controlled in its initial stage. No particular damage to crops was reported. About 586 lbs. of sulphur dust to cover 4,719 acres under jowar was distributed to cultivators free of cost for treating their jowar seed against smut diseases. 1.322 lbs. of sulphur dust was distributed for dusting on cumin crop in an area of 125 acres to ward off powdery mildew.

(*f*) *Special Schemes, if any.*—(1) Vegetable Development Scheme—An additional area of about 154 acres and 18 gunthas during the *kharif* season and 174 acres and 2 gunthas during the *rabi* season was brought under vegetable cultivation during the period under report.

(2) Sweet potato Scheme—An additional area of about 103 acres during the *kharif* season and 200 acres during the *rabi* season was brought under sweet potato and subsidy at Rs. 20 per additional acreage was paid to the cultivators.

(3) Potato Extension Scheme—Potato is grown in the *rabi* season only. About 10,066 B. Mds. of Simla potato seeds was distributed, which covered an area of about 719 acres.

D. *Agricultural Demonstration Centres*

There were 11 Agricultural Demonstration Centres in all, of which, two were newly opened at Nanakalodra in Cambay and at Jorapura in Balasinor, i.e. in the merged state areas.

E. *Miscellaneous Activities*

Articles on 'Bumper Yield of Bajri', 'Cumin Crop', 'Prize yield of paddy', etc., were given for publication in the 'Farmer' Magazine. Enquiries regarding cement pipes, engines, tractors, Government waste lands cases of land Mortgage Bank, etc., were attended to promptly.

Technical advice in the matter of agriculture was given to cultivators.

K. R. PATEL,
District Agricultural Officer,
Kaira, Nadiad.

PROGRAMME OF WORK FOR THE YEAR 1950-51

	Target	Area to be covered acres.
(1) Distribution of Bajri 207.	7,500 B. Mds.	75,000
(2) Multiplication and distribution of N-4 Wheat.	1,000 B. Mds.	1,000
(3) Distribution of groundnut cake.	5,436 tons.	27,180
(4) Distribution of manure mixture	85 tons.	680
(5) Rural compost Scheme ...	5,000 pits to be dug.	2,500
(6) Town compost Scheme ...	8,630 tons.	1,726
(7) Construction of new wells and improvement of old wells.	2,400 { 500 New wells. 200 Old wells.	
(8) Sweet Potato Scheme ...	...	200 Kharif 100 rabi
(9) Vegetables Scheme ...	...	300
(10) Potato cultivation ...	24,000 B. Md. to be distributed.	
(11) Improvement of farmyard manure.	24,000 pits to be dug in 400 villages.	12,000
(12) Lift Irrigation Schemes, Ratnapur.	1,800 acres to be irrigated.	

(13) General—Propaganda—Propaganda of improved implements manures and seeds will be carried out by arranging meetings and general talks.

(14) Agricultural Demonstration Centres—At least two demonstrations will be held at each centre during the month and improved practices of agriculture, etc. will be shown to the cultivators.

(15) District trials—Trials of paddy, bavto, kodra, etc., evolved at the Research Station will be taken up on cultivator's fields.

K. R. PATEL,
District Agricultural Officer,
Kaira, Nadiad.

APPENDIX XXXVII.

Summary of the work done under the District Agricultural Officer, Ahmedabad, for the year 1949-50

A. *Staff and Administration*

Shri J. V. Oza, continued as District Agricultural Officer, Ahmedabad, during the year under report. The other district staff was as under:—

One Assistant District Agricultural Officer.

Two Agricultural Officers I/C Revenue Sub-Divisions.

Thirty two Agricultural Assistants.

B. *Season*

The season was characterised by a total rainfall of 20 to 25 inches as against an average rainfall of 25 to 30 inches. The distribution of the rain was very even and therefore, greatly helpful for the proper development of crops. Excepting the paddy crop for which the rainfall was inadequate, all the crop developed well and gave bumper yields. There was a cold wave in the month of February, 1950, and it damaged in varying degrees the standing crops of cotton, tobacco, caster, potato and vegetables.

C. *Grow More Food Campaign*

(*a*) *Seeds*—

(*i*) *Nadiad bajri No. 207.*—37-20 B. Mds. of II stage seed and 25 B. Mds. of III stage seed of Nadiad bajri 207 were distributed to cover 356 acres and 242 acres, respectively.

35 B. Mds. of II stage seed and 124-12½ B. Mds. of III stage seed of bajri No. 207 was transferred to the Sabarkantha district for further multiplication in that district.

(*ii*) *Wheat Niphad-4*—20 B. Mds. of nucleus seed and 185 B. Mds. of stage III seed of Niphad-4 wheat was distributed to cultivators for further multiplication. 64-20 B. Mds. seed of Niphad-4 wheat was transferred to the Sabarkantha district for further multiplication in that district.

(b) *Manures*—

(i) The following quantities of manures were distributed:

	Quantity (tons.)	Area covered (acres)
Sulphate of ammonia.	... 21	315
Groundnut cake for manuring potato crop.	843	843
Groundnut cake for manuring food-crops.	256	1,280
Manure mixture	... 347	2,776
Superphosphate	... 1	12

(ii) The following work was done in respect of preparation of rural and town compost and in the improvement of farmyard manure.

	No. of pits dug.	No. of pits filled	Quantity in Cft. of the ripe compost prepared.
Rural compost	... 763	516	64,500 Cft.
Town compost	...	—	2,02,650 Cft.
Farmyard manure	... 620	43	5,400 Cft.

(c) *Irrigation Schemes.*—Construction of new wells and repairs to old wells:—During the year under report 4,263 applications for construction of new wells and 1,259 applications for repairs to old wells were sanctioned and of these 1,587 new wells were constructed and 301 old wells were repaired.

(d) *Propaganda and publicity, including shows.*—No show was organised during the year. 6 demonstrations on the various improvements advocated by the Department were held on Agricultural Development centres and other places. A large number of demonstrations in connection with the proper methods of preparing compost manure and farmyard manure were also held all over the district.

(e) *Insect pests and plant diseases.*—696 lbs. of sulphur dust was supplied to the cultivators for treatment of jowar seed against the grain smut disease. There was no other major attack of any pest or disease.

(f) *Special schemes, if any*—

(i) *Lift Irrigation Scheme.*—Under the lift irrigation scheme at Miroli, the following crops were raised.

Name of the Crop.		Area (acres)
Paddy	...	343-38
Wheat	...	625-22
Hot-season crops	...	78-11

(*ii*) *Vegetable Development Scheme.*—During the year under report 735 acres and 13 gunthas of additional area was brought under cultivation of vegetables. 196 additional acres were also brought under cultivation of sweet potatoes.

(*iii*) *Potato scheme.*—10,260 B. Mds. of potato seed was supplied to the potato growers through the Potato Supply and Extension Officer.

(*iv*) *Selection of seed in the Revenue godowns.*—The following quantities of seeds were selected and reserved for seed purposes in the Revenue godowns:—

Wheat	4,025 B. Mds.
Jowar	81,895 B. Mds.
Paddy	20,343 B. Mds.
Bajri	2,520 B. Mds.

D. *Agricultural Demonstration Centres*

There were in all 7 Agricultural Demonstration centres in the district. The work of demonstrating the various Agricultural improvements and of maintaining the cost of production data of different crops was carried on as usual.

E. *Miscellaneous activities*

(1) A large number of applications for supply of petrol for starting or running of oil engines and tractors and for transport of manures were inquired with and petrol was supplied to all genuine cases.

(2) The Taluka Agricultural Assistants worked as the Secretaries of the Taluka Rural Development Boards and handled the work of distribution of essential articles like iron, steel and cement for agricultural purposes.

(3) Priority certificates for early movement of articles required in the district in the interest of 'Grow More Food' Campaign were issued to *bona fide* cultivators after due inquiries.

J. V. OZA,
District Agricultural Officer,
Ahmedabad.

PROGRAMME OF WORK FOR THE YEAR 1950-51

The work of all the 'Grow More Food' Schemes and other activities will be continued with greater intensity during the year.

2,900 B. Mds. of bajri-207 seed will be distributed to cover an area of 29,000 acres. Similarly, 1,790 B. Mds. of wheat N-4 seed will be distributed for further multiplication. The produce of bajri 207 seed distributed will be procured to the extent of 2,000 B. Mds. while the entire produce of wheat N-4 seed will be procured for further distribution. The work in respect of compost manures and farmyard manure will be continued as usual. The distribution of artificial manures like manure mixture, sulphate of ammonia, superphosphate and groundnut cake, will be carried on with greater intensity than before. Work on various irrigation schemes will also be carried on as usual.

As special staff has been appointed under the Plant Protection Scheme, the work of protecting the plants from insects pests and plant diseases will be carried on a much larger scale and with great promptness. The other miscellaneous activities, such as selection of seeds in the Revenue Godowns, disposal of applications for supply of petrol, the work of the Agricultural Demonstration Centres, the work of the District Rural Development Board and the Taluka Development Boards, etc., will be attended to as usual.

J. V. OZA,
District Agricultural Officer,
Ahmedabad.

APPENDIX XXXVIII

Summary of the work done under the District Agricultural Officer, Sabarkantha, Himatnagar, for the year 1949-50

A. *Staff and Administration*

Shri B. K. Mehta continued to hold charge of the post of District Agricultural Officer, Sabarkantha, throughout the year under report. He was assisted by one Assistant District Agricultural Officer in his day to day work. The District staff consisted of 3 Agricultural Officers I/C Revenue Sub-Divisions and 32 Agricultural Assistants.

B. *Season*

The monsoon broke in the second week of July creeping in by the southern part of the district viz. Prantij, and slowly extended its activity to the upper region viz. Idar and Vijaynagar. In about a fortnight's time it had fairly established itself and gave hopes that the fall would be normal and would compensate for the deficit of the two previous years. The hopes were shattered by its erratic nature. Commencing with light drizzle throughout the month of July and a sudden heavy pour in August, it again slackened its activity to a meagre fall and complete stoppage in the first week of September. Thus, throughout its season, except for a little generosity in August, it was very sparing in its fall so much so that it only kept the crops growing. The total average of the district amounted to 24-8 inches as against 35 inches of average normal.

Cold spell, started in the 3rd week of November and showed its severity from the 3rd week of December to the end of January, after which it slowly gave away to summer heat. The dry chill winds of mid January affected a number of crops and had an adverse effect on the meagre soil moisture. The intensity of heat was all the more felt partly due to the shortage of water and frequent dust storms and scorching heat was felt from the 3rd week of May right up to the break of the monsoon.

Due to its light precipitations the season was very good for bajri crop which gave a bumper yield, but other crops suffered badly. *Kharif* jowar as well as *rabi* jowar got a set back as there were no showers in September. Cotton had to strive for its existance, absence of September rains and early dry spell, cut the crop to half of its normal yield. Groundnut and bajri fared better, but wheat had to be kept up on continuous irrigation. Paddy was a miserable failure while maize stood next to bajri. Other minor crops like ragi, castor, tobacco, sugarcane, sesamum were all below normal.

In this newly formed district it was not possible to compile crop statistics on regular lines as the area in the district was unsurveyed and village papers were not maintained. Accordingly it was not possible to say definitely the increase or decrease under each crop.

C. *Agricultural Research*

Research work could not be undertaken in the newly constituted district in absence of any experimental farm. Proposals for the establishment of such a farm are under consideration.

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D. *Grow More Food Campaign*

Extension and development work.—A start in this direction was made by supply of improved seeds, encouragement for growing of sweet potatoes, potatoes, compost making and distribution of sulphate of ammonia and manure mixture as under:—

(i) *Seed supply.*—Nadiad 207 type of bajri was introduced for distribution in the district. 3 B. Mds. of nucleus seed were purchased from Government Farm, Boriawi and issued to the cultivators for multiplication. Originally the district had 8 talukas, later on in the month of August a fresh re-adustment of the talukas for Sabarkantha was made with a result that Modasa and Prantij were added to it. In addition, 35 B. Mds. of nucleus seed and 124 B. Mds. of the II stage seed of Nadiad 207 bajri were distributed in the newly constituted talukas of Modasa and Prantij. 57 B. Mds. and 20 seers of Niphad-4 wheat seed were distributed in the Prantij taluka.

The normal area under cotton is 1,03,026 acres and the variety mainly grown is a mixture of various types with 1027 A. L. F. predominating. As per policy fixed by the Indian Central Cotton Committee to have Mahi Sabarmati Zone under the Vijay cotton the seed of this variety was distributed and a regular scheme for the multiplication and extension commenced from this year. During the year under review, 193½ B. Mds. of general seed was issued to cover an area of 1,934 acres in 7 villages. Of this area, the fieldman incharge roughed 374 acres and certified 340 acres as B grade showing 98 per cent purity. This cotton was ginned under the departmental supervision and 750½ B. Mds. of seed was contained for multiplication for next year. Besides this, 2,388 B. Mds. of seed was received from the Broach and Kaira districts for distribution in this district.

Subsidiary food campaign could not be pushed on vigorously, partly for want of staff and mainly due to the failure of monsoon. However, a few persons were induced to go in for the cultivation of sweet potatoes and other vegetables and encouragement by way of subsidy was given. The area covered under sweet potatoes and vegetables was 82 acres 9 gunthas and the subsidy paid was Rs. 1,644-8-0.

(*ii*) *Manure.*—The work was limited to the sale of sulphate of ammonia, manure mixture and groundnut cake and compost making. The first two items had to be brought from

outside, and it being a new introduction, much head way could not be made. However the following figures will show the distribution:—

	Quantity distributed. T C Q L
Sulphate of ammonia	4-8-0-0
Manure mixture	16-4-1-4
Groundnut cake	164-15-3-16

Compost making.—The activity was aimed at town refuse in urban area and farm waste in rural areas. In absence of any arrangements for the sanitary disposal by the Municipalities this work could not be pushed on to a great extent.

As regards composting of farm waste, a vigorous propaganda backed by the allurement of subsidy was made. The total number of pits dug was 1,080 of which 460 pits were filled in.

E. *Agricultural Demonstration Centres*

There were two Agricultural Demonstration Centres in this district which were transferred from Ahmedabad due to transfer of the Prantij and Modasa talukas to this district. Demonstrations of compost pits were held on these centres. Improved varieties of bajri, cotton and wheat were grown for demonstration purposes and Gulab and Bhal wheat trial was taken on one of these centres.

Insect pests and diseases.—121 lbs. of sulphur dust were sold to the needy cultivators for the effective control of smut on jowar.

F. *Miscellaneous activities*

Help was rendered to the cultivators in securing crude oil and petrol for their oil engines and to others in getting their subsidy for wells dug out for irrigation purposes. During the year, 160 wells were inspected and certified as complete for final payment.

34 applications for starting engines and tractors agricultural purposes were verified and recommended for supply of petrol to the Area Rationing Authority, Ahmedabad, and 11 certificates were issued for transport of engines, implements and tractors for agricultural purposes. Seed selection from the locally purchased stocks was done and 56,381 B. Mds. of seed of various *kharif* and *rabi* crops was selected.

B. K. MEHTA,
District Agricultural Officer,
Sabarkantha, Himatnagar.

PROGRAMME OF WORK FOR THE YEAR 1950-51

The work of all the schemes and activities mentioned in the above report will be pushed on and efforts will be made to reach the targets fixed for the schemes. The work of all 'Grow More Food' Schemes will be intensified with the help of Taluka Rural Development Boards and Village Food Production Committees.

B. K. MEHTA,
District Agricultural Officer,
Sabarkantha, Himatnagar.

APPENDIX XXXIX

Summary of the work done under the District Agricultural Officer, Banaskantha, Palanpur, for the year 1949-50

A. *Staff and Administration*

Shri S. S. Patel continued to work as District Agricultural Officer, Banaskantha, Palanpur, during the year under report.

The district staff consisted of one Assistant District Agricultural Officer, two Agricultural Officers I/C Revenue Sub-Divisions and five Agricultural Assistants.

B. *Season*

The agricultural season of 1949-50, was fairly satisfactory over the greater part of the Banaskantha district for the *kharif* and *rabi* crops as deduced from cropped area and the outturn of main crops, like bajri, pulses and wheat. It was much better than that of the preceding year. The rainfall received during the year amounted to 17 inches on an average i.e. much below the annual average of 30 inches. The regular and effective rain was received from July, which gave indication of prospective season, but August and subsequent rainfall was scanty, which proved a little harmful to the growth of jowar later on and bajri in the Vadgam Taluka. On the whole, the rain was quite adequate for the successful growth of bajri, pulses and til. The shortage of subsoil water was felt all over the district due to deficiency of rainfall. Thus the area under irrigated crops like wheat, rape, etc., was much curtailed. A severe frost had occured during 1st fortnight of February which damaged the crops as under:—

1. Wheat 10 to 15 per cent (Late sown crops were much).
2. Potato 20 to 30 per cent (damaged).
3. Castors 25 per cent.

The peculiarity of the season was that there was no rust appearance in wheat crop. This can be attributed to less dew formation.

The unseasonal rains were not received, so also the sky remained clear throughout the fair weather. The crops were absolutely free from insect pests.

C. *Grow More Food Campaign*

(A) *Seed Supply.*—The multiplication and distribution of improved strains of crops, such as bajri 207 and wheat Niphad-4, were started during the season under report by procuring the necessary nucleus seeds from the respective breeding stations.

(*i*) *Rice Seed Distribution.*—The area under the crop was very limited growing medium and inferior varieties of paddy in the Palanpur Division.

Considering the rainfall and soil condition, no other improved strain of paddy would fare well. It was suggested that the early variety of paddy, viz., Sathi, which is fairly good in grain quality would thrive well in the less rainfall tract. 1,200 lbs. of this paddy seed was given to the growers by importing it from the Baroda district for sowing during 1950-51 *kharif* season.

(*ii*) *Jowar & Bajri Seed Distribution.*—120 lbs. of seed of improved Bajri 207 was indented for multiplication during the season in this district. The resultant seed of about 4,800 lbs. was distributed to the registered seed growers during the current season covering an area of about 481 acres for further multiplication.

(*iii*) *Wheat seed Distribution.*—320 lbs. of improved seed of wheat strain Niphad 4 was distributed to the registered seed growers for multiplication during the season under report. The resultant seed of about 3,523 lbs. will be distributed during the next wheat sowing season.

(*iv*) *Selection and distribution of seeds of other crops.*—Selection of general seeds of bajri, jowar, wheat, maize, etc. viz. about 52,021 bags from the Revenue godowns for distribution as seed in case of emergency, was made by the staff of the Agricultural Department working in this area.

(*v*) *Agricultural Propaganda.*—Extension work in connection with the "Grow More Food Campaign" has been started in the newly constituted district in popularizing improved

methods of agriculture and the supply of better materials required by the cultivators, i.e. seeds, manures, implements, insecticides, etc.

(B) *Manures*—

(*i*) *Rural compost.*—During the year under report, 568 compost pits were dug and filled. The resulting ripe manure will be applied during the next sowing season.

(*ii*) *Town compost.*—The municipalities of the area prepared 326 tons of compost (Town) and sold it to the farmers for food production.

(*iii*) 330 tons of groundnut cake were supplied to the cultivators at a subsidised rate.

(*iv*) 8 tons of manure mixture for foodcrops were distributed for *kharif* crops and wheat.

(*v*) *Potato manure mixture.*—25 tons of the mixture was supplied to the potato growers and the results were highly satisfactory.

(*c*) *Irrigation.*—658 new wells were constructed during the year under report and 16 old wells were repaired during year under report.

(D) *Insect pests and diseases.*—During the season under report there was no trouble from the hairy catterpillars, but there was emergence of grasshoppers having green colour, but its damage was not so serious. At the fag end of the season reports were afloat of the coming invasion of the North West locusts. Due precautions were taken by issuing necessary instructions to the Agricultural staff for preventive measures. Government of India also posted one anti-locuts officer at Tharad to watch the movement of the swarms.

D. *Dry Farming Research Station, Deesa*

The total area of this station is 25 acres. During the year under report, multiplication of improved strains, such as Bajri 207, Spanish peanut, groundnut, Sammeri maize and China mug, was done. Sammeri maize and China mug did not fare well on account of inadequate late rains, but bajri crop came out very successful. The resultant seed was distributed in the district during this season.

The Soil Physicist to Government, Poona, has laid out agronomic experiments on Dry Farming methods, such as seed rate cum spacing during the current season.

E. *Extension of Cotton*

Vijay cotton seed weighing 800 lbs. was supplied to the cultivators of Amirgadh for sowing during the *kharif* season of 1950-51 for increasing production of cotton.

With the same object in view, Kalyan cotton seeds weighing 1,480 lbs. was supplied to the cultivators of Amirgadh and Iqbalgadh.

F. *Agricultural Demonstration Centres*

As this district was newly constituted, the sites of the Agricultural Demonstration Centres were being surveyed during the year under report and necessary reports were submitted to the District Rural Development Board for its approval. They were approved by the Board and their equipment was awaited on the receipts of the grants required, for which proposals were already been sent.

G. *Miscellaneous activities*

In the last week of January, 1950, one Agricultural Show was organised on the Deesa Farm to demonstrate the improved strains, such as Bajri 207, Spanish peanut, groundnut, China mug, Sammeri maize and wheat Niphad 4. Besides, suitable improved implements, such as Baroda hoes, Turn rest Plough, ploughs and drills were also exhibited. Moreover, insecticides, such as gammexane against store pests and grasshoppers and fungicides such as Sulphar dust against jowar smuts with their equipments, were fully demonstrated.

S. S. PATEL,
District Agricultural Officer,
Banaskantha, Palanpur.

PROGRAMME OF WORK FOR THE YEAR 1950-51

1. To equip and organise 10 Agricultural Demonstration Centres in the district.

2. To distribute and multiply the improved strains as under:

	Area to be covered, (acres)	Quantity of seed to be procured (B. Mds)
(*a*) Bajri 207	500	500
(*b*) Sameri maize	20	100
(c) N-4 Wheat	40	200

3. *Manures & Fertilisers.*—To stock and distribute manures as under:—

(*a*) Groundnut cake for foodcrops. ... 75 tons.
(*b*) Manure mixture for foodcrops ... 43 tons.

Compost making in Rural areas	...	8,000 pits to be dug.
(c) Town compost	...	1,100 tons.
(d) Sulphate of ammonia	...	20 tons.
(e) Superphosphate	...	10 tons.
(f) Potato manure mixture	...	50 tons.

4. *Irrigation Scheme.*—Construction and improvement of wells:—

New wells to be constructed.	...	800
Old wells to be repaired	...	100

5. *Extension of cultivation of other crops*:—

(1) Scheme for sweet potato cultivation

		(Area to be covered acres).
Kharif	...	50
Rabi	...	50

(2) Scheme for vegetable Extension ... 200

(3) Scheme for cultivation of potatoes Quantity of seed to be distributed 40,000 B. Mds.

(4) Scheme for distribution of ground-nut cake for potato crops Quantity to be distributed ... 400 tons.

(5) No. of villages to be selected for improvement of farmyard manure. 19,200 pits to be dug in 275 villages.

(6) To attend miscellaneous requirements as under:—

(a) To distribute 500 Allen Gandhi Baroda Hoes.

(b) To distribute 400 lbs. of Sulphur against jowar smuts.

(c) To hold demonstrations at various places during *kharif* and rabi seasons No. 100.

(d) To conduct manurial & varietal trials on.

Niphad 4 V/S Local	...	10
Bajri 207 V/S Local	...	10
Sameri maize V/S Local	...	10

(e) General seed selection from Government Godown.

(f) To attend to the meetings of the District Rural Development Board.

(g) To make efforts to increase the area under improved cotton.

S. S. PATEL,
District Agricultural Officer,
Banaskantha, Palanpur.

Appendix XL

Summary of the work done under the District Agricultural Officer, Baroda, for the year 1949-50

A. *Staff and Administration*

The Baroda State was merged with the Bombay State from the 1st August, 1949, and as a result of this merger, this office has been newly established since that date. Shri A. F. Patel was appointed District Agricultural Officer, Baroda, and he was incharge of whole district during the year under report. The district staff consisted of one Assistant District Agricultural Officer, 3 Agricultural Officers incharge Revenue Sub-Divisions and 30 Agricultural Assistants. The main function of this office is to carry on vigorous propaganda in furtherance of the 'Grow More Food' Campaign and accordingly vigorous propaganda in that direction has been carried out by the district staff during the year under report in order to bring the activities of this district on the lines of those in other Bombay State districts.

B. *Season*

During the year under report, the season was on the whole favourable for all the *kharif* as well as *rabi* crops and the yields obtained were normal. The total rainfall recorded throughout the district was 30″ to 40″.

The growth of Foodcrops Act, 1944, was made applicable to the merged area of the Baroda district during the year under report and the cultivators were allowed to grow tobacco in 1/5 to 1/6 of their total cultivated area.

Seed Supply.—As a part of the 'Grow More Food' Campaign, improved seed of bajri and wheat are being distributed amongst the cultivators There is a great demand for improved seed, particularly N-4 wheat seed.

C. *'Grow More Food' Campaign*

(*a*) *Seeds.*—(*i*) Improved bajri No. 207 (Nadiad) seed scheme was extended in the Baroda district. During the year under review, 800 B. Mds. of bajri seed was purchased from the District Agricultural Officer, Kaira, Nadiad, and supplied to cultivators, which would cover an area of nearly 8,000 acres. The remaining area will be covered during the next year.

(*ii*) *Improved wheat N-4 seed scheme.*—This scheme was extended to this district during the year under report. The

target fixed for this scheme was 86½ B. Mds. of wheat N-4 seed for covering an area of 86 acres, the produce of which will be entirely purchased from the cultivators to whom this seed would be supplied. The total area under wheat in this district was about 30,000 acres, which will be covered by this improved seed within a period of 3 years, i. e., in 1952-53.

(*iii*) *Distribution of seed of other crops.*—Nearly 101 B. Mds. of K-226 and Z-31 paddy seeds were imported from Government Farms, Vyara, and Karjat, and were supplied to the cultivators of Savli and Dabhoi talukas where tank protected late types of paddy were being grown.

(b) *Manures.*—As regards manures, nearly 7,000 tons of compost were applied for 1,400 acres of land. 3,860 tons of Town compost was prepared and applied to 772 acres of land. 625 tons of sulphate of ammonia was distributed for foodcrops and vegetables for manuring 6,250 acres of land. About 2,605 tons of groundnut cake were distributed for foodcrops and vegetables. 571 tons of manure mixure were distributed for the *rabi* as well as the *kharif* crops. 707 lbs. of sulphur dust was distributed for smut of jowar.

(c) *Agricultural Propaganda.*—Intensive propaganda in connection with various activities of the schemes launched by Govenrment were carried out by the District Staff in furtherance of the 'Grow More Food' Campaign.

D. *Extension of Cotton*

The Indian Central Cotton Committee is also subsidising a scheme for the multiplication and distribution of seed of improved strains of cotton, viz. Vijay in Baroda district. About 90 B. Mds. of Mesta seed have been distributed amongst the cultivators and that 250 acres will be grown under mesta.

E. *Agricultural Demonstration Centre*

This district being recently merged with the Bombay State the work of selection of sites for Agricultural Demonstration Centres was in progress and the working of these centres would be started on their final approval.

F. *Waste Lands*

The military bid lands of 5,556 acres in the Waghodia taluka of the Baroda district are to be brought under cultivation. During the year, about 600 acres were plowed and crops, like cotton, paddy and jowar, were grown. 142 families of displaced persons have settled on these areas.

G. *Village Rehabilitation Scheme, Amroli*

This scheme is being subsidised by the Indian Council of Agricultural Research. Four systems of farming, viz., (1) Proprietory, (2) Tenants-at-will, (3) Co-operative, and (4) Collective, are being studied under this scheme. In all, 137 families of local Raniparj cultivators have been re-habilitated at Amroli. All agricultural operations were being conducted under the supervision of the Agricultural Department. The monetory, yields and net profit per acre derived from different systems of tenures were being studied.

The order of merit was as below:—

Proprietory	...	I
Tenants-at-will, Collective	...	II
Co-operative	...	III

In general, the yields of all crops grown in the Scheme areas were much more higher, i.e., 40 to 90 per cent, than those derived by the cultivators in the adjoining villages.

A. F. PATEL,
District Agricultural Officer,
Baroda.

PROGRAMME OF WORK FOR THE YEAR 1950-51

(1) *Seed Schemes.*—(*i*) 800 B. Mds. of Nadiad Bajri seed to be distributed among the cultivators.

(*ii*) 340 B. Mds. of N-4 wheat seed will be collected from the registered seed growers for further distribution.

(2) *Manures.*—3,300 tons of groundnut cake, 396 tons of manure mixture, 1,100 tons of sulphate of ammonia, and 90 tons of superphosphate to be distributed amongst the cultivators.

4,000 compost pits will be dug and 24,000 farmyard manure pits will be improved. 9,040 tons of town compost to be prepared by the Municipalities.

(3) *Irrigation Schemes.*—500 new wells to be dug and 250 old wells to be repaired. 30 bores to be made for improving the water flow of the wells.

(4) *Tractor ploughing.*—8,100 acres to be ploughed with the tractors.

(5) 12,000 B. Mds. of potato seed to be given to cultivators. Sweet potatoes to be grown on an additional area of 150 acres and vegetables to be grown on an additional area of 300 acres in the Baroda district.

(6) Nearly 90,000 seeds and seedlings will be planted during Vanamahotsava.

(7) One District Agricultural Show to be held in the Baroda district and several classes for training of social workers to be conducted.

A. F. PATEL,
District Agricultural Officer,
Baroda.

APPENDIX XLI

Summary of the Work done under the District Agricultural Officer, Mehsana, for the year 1949-50

A. *Staff and Administration*

The Mehsana district comprised twelve talukas before the merger of the Baroda State with the Bombay State. After the merger, two talukas, viz., Dehgam and Attarsumba were cut off from this district and ceded to the Ahmedabad and Kaira districts. On the other hand, Radhanpur, Sami and Santalpur talukas, which formed part of the Banaskantha district, have now been attached to the Mehsana district, which eventually is made up of thirteen talukas and four Revenue Sub-divisions. The merger of the Mehsana district with the Bombay State took place from the 1st August, 1949.

Shri G. G. Nawathe remained incharge of the Mehsana district as District Agricultural Officer, from 1st August, 1949, till the end of the period under report, except for the period from the 14th May, 1950, to 13th June, 1950, when he was on earned leave. Shri K. C. Desai, Assistant District Agricultural Officer, held charge of the post of District Agricultural Officer during the period of leave of Shri Nawathe.

The district staff consisted of one Assistant District Agricultural Officer, 3 Agricultural Officers incharge Revenue Subdivisions and 51 Agricultural Assistants.

B. *Season*

Monsoon commenced late in June, 1949, when only light showers were received all over the district, the total rainfall for the month being less than an inch. Wet season however set in July, when sowing of all *kharif* crops were undertaken. The rains during the season were ill distributed and it failed partially. As a result, the *kharif* crops, like bajri, jowar, paddy and cotton, suffered to a greater extent in parts of deficit

rainfall, such as Mehsana and Patan Sub-divisions. The setting in of cold season had been observed from the beginning of November. The cold was moderate until last week of December, when it became severe. The effect of frost was slightly observed on wheat, tobacco, and cotton and others. The *rabi* crops, however, progressed fairly satisfactorily, but on account of shortage of water in wells and ponds, the area under wheat crop decreased by about 40 per cent.

The Growth of Foodcrops Act, 1949, was not rigidly applied to this district in view of the fact that this district was merged with the Bombay State when the season was far advanced. The Cotton Control Act was not applied to this district. However, the cultivators were adviced to grow *kalyan* cotton in place of wagad.

C. *'Grow More Food' Campaign*

The 'Grow More Food' Campaign formed the major part of the work in agricultural activities since this district was merged with Bombay State. The schemes were applied to this district. The *kharif* season had well advanced and therefore, the work done in the period up to the end of June, 1950, was as under:—

(1) *Improved Seeds.*—No target was fixed, the district being recently merged with the Bombay State. However, the department having secured some seeds of improved wheat varieties of P. 52 and C. 13, from the Jagudan and Deodarda Farms, these were given to the registered seed-growers on sawai basis, to the extent of 70 B. Mds. 110-18 B. Mds. of Pusa-52, were collected for distribution in the third quarter ending December, 1950.

(2) *Manures*—(*a*) Manure mixture—During the period under report, 75 tons of manure mixture manufactured by the Baroda Government and 120 tons by the Bombay Agricultural Department were stocked, of which, 135 tons were distributed mostly for foodcrops, which covered 1,080 acres.

(*b*) Groundnut cake—Lifting of groundnut cake from the local oil mills and distributing the same to the cultivators was taken up from May, 1950. During the period of two months 83 tons of groundnut cake was sold to cultivators and 33 tons was despatched to the Banaskantha district.

(*c*) Sulphate of ammonia—15 tons of sulphate of ammonia received for distribution, was all given to the cultivators and

in addition, 3 tons from the old stock. In all, 18 tons of sulphate of ammonia was distributed to cover an area of 288 acres.

(*d*) Compost pits—During the period under report, 3,788 pits were dug, out of which, 2,679 pits were filled in. This produced 6,697½ tons of compost to cover 1,340 acres.

(*e*) Farmyard manure pits—The farmyard manure scheme details were available late and hence the survey work could only be completed. 275 villages were selected for the year 1950-51.

(*f*) Town compost—There were 13 Municipalities in this district, but they were not preparing compost systematically and satisfactorily and so contracts were made with the Municipalities and work encouraged. They were given instructions to prepare compost of night soil and refuse of the towns. About 6 Municipalities started the work of manufacturing town compost and 168 tons town compost was prepared. This quantity covered 33 acres.

(3) *Irrigation Scheme.*—The scheme for wells was introduced this season for the first time under Government rules with the necessary propaganda in this respect. More than 6,000 applications were received from farmers for tagavi or subsidy, or both, for new wells, repairs to old wells, boring in wells and for machinery for pumping water from wells. The work was in progress during the period under review. Tagavi of Rs. 13,67,842 was given for 687 new wells and for repairs to 536 old wells. Subsidy alone was given for 11 new wells and 10 old wells.

(4) *Vegetable extension.*—(*a*) *Potato.*—Under this scheme, 1,284 mds. of potato seed was obtained from Simla through the Potato Supply and Extension Officer, Poona. Cultivators also obtained 540 B. Mds. of seed on their initiative.

(5) *Plant Protection Scheme.*—The scheme was not made applicable to this district. However, 21,072 lb. of sulphur dust was supplied to cultivators for dusting on cumin crop against mildew. This covered the area of about 2,107 acres.

(6) *Distribution of implements.*—Baroda hoe was found very popular in this district as an implement both for preparatory tillage and inter-tillage. 1,287 Baroda hoes were sold at the concessional rate of Rs. 20 per hoe.

D. *Miscellaneous Activities*

(1) *Tree planting.*—It is essential in more respects than one to grow a large number of trees in this district which is on the

border of a desert. Efforts for this line were made on all points as a result of which about 50,500 trees were planted in the year under report, but due to very unfavourable weather conditions and shortage of rains, a large number of seedlings perished.

(2) *Gram Sudhar Saptaha.*—This was celebrated from the 2nd to the 8th October, 1949, throughout the district. Small exhibitions of agricultural samples, compost making, were shown and demonstrated.

(3) *Training Classes for Social Workers.*—Three agricultural training classes were conducted in this district for cultivators interested in agriculture. They were informed of the agricultural activities going on in this district and also of various 'Grow More Food' Campaign schemes offered by Government. In all, 66 trainees attended the Classes.

G. G. NAWATHE,
District Agricultural Officer,
Mehsana.

PROGRAMME OF WORK FOR THE YEAR 1950-51

The programme for 1950-51 is given below:—

(1) Distribution of improved seed.	500 B. Mds. of bajri No. 207 and 250 B. Mds. of wheat P.52 and N-4.
(2) Distribution of rural manure.	150 tons groundnut cake and 200 tons manure mixture.
(3) Digging of rural compost and farmyard maunre pits.	3,000 compost pits and 19,200 farmyard manure pits will be dug.
(4) Town compost	6,200 tons of compost will be prepared out of town refuse.
(5) Construction of new wells and repairs to old wells.	2,500 new wells will be constructed and 800 old wells will be repaired.
(6) Extension of cultivation ...	(*i*) Additional area of 200 acres under vegetable and 200 acres under sweet potato will be brought under cultivation.
	(*ii*) 2,000 B. Mds. of potato seed will be distributed.

G. G. NAWATHE,
District Agricultural Officer,
Mehsana.

Appendix XLII

Summary of the Work done under the District Agricultural Officer, Amreli, for the year 1949-50

A. *Staff and Administration*

Shri P. C. Mehta was appointed District Agricultural Officer, Amreli, from the 1st August, 1949. The district staff consisted of one Assistant District Agricultural Officer, 2 Agricultural Officers incharge Revenue Sub-divisions, and 19 Agricultural Assistants.

Amreli district having merged with the State of Bombay late in the season in the month of August, 1949, all the schemes could not be taken on hand. Still, however, the following schemes of seeds, manures, vegetables and plant protection were worked in the district with the achievements as follows:

B. *'Grow More Food' Campaign*

(*a*) *Seed Schemes.*—The staple crops of the district are bajri, jowar, wheat and paddy. Of these, Amreli has got a good strain of bajri of its own, and hence it was out of question, while on account of vaguaries of rains, jowar is the main problem of the district, when considerably large area remains under the crop every year. When the failure of late rains has become a common phenomena of the district, every year jowar crop fails to give the desired yield, early selected jowar is the only solution to remedy the defect. As such, early selected strain of jowar of the Amreli Farm was selected for extension in the district with an early maturity of 20 days and higher yield of about 20 per cent as compared with the local in normal years. 928 lbs. of seed was distributed from the farm, covering an area of 64 acres, with an expected outturn of 75 bengali maunds, enough for 600 acres to be sown.

N-4 wheat—33 bengali maunds of seed was distributed to the cultivators to cover an area of 41 acres. From this, 267 bengali maunds of seed was collected and distributed for this year.

Pratap cotton—1,320 lb. of seed of Pratap cotton was distributed to the cultivators covering an area of 62 acres.

(*b*) *Manure schemes.*—People in this district were hardly accustomed to the use of manure mixture, groundnut cake, and superphosphate, only sulphate of ammonia being common with them. As such, it was with great difficulty that these manures were introduced and their efficacy was brought to their mind.

The distribution was carried out as follows with respective increase in production.

S. No.	Name of manure.	Quantity distributed.		Area covered.	Increase in yield.
		Tons.	Cwt.	Acres.	Tons.
1.	Manure mixture	76	10	600	45
2.	Sulphate of ammonia	53	3	300	22
3.	Superphosphate	10	2	150	10
4.	Groundnut cake—				
	(*i*) for foodcrops	38	9	304	21
	(*ii*) for cattle feed	544	0	—	—
5.	Rural compost (3,000 pits taken and (Manure composted) 2,125 pits filled).	5,312	0	2,125	152
6.	Town compost	—		—	—

(*c*) *Extension of area under other crops.*—Efforts were made in the direction of increasing the area under vegetables, sweet potatoes, and potatoes, and the people gave good response to our departmental propaganda increasing the area from 400 acres to 1,000 acres under vegetables and to 63 acres and 2½ acres under sweet potato and potatoes, respectively. Potato is in a trial stage and liking of the people for this crop is in growing trend with a good scope for future development.

(*d*) *Irrigation.*—Minor irrigations—The Amreli district with plenty of sub-soil water at 30-40 feet depth met with at various places, is naturally suited to well irrigation with a wide scope for sinking large number of wells. During the year under report, 131 wells were sunk and 38 wells were repaired.

(*e*) *Publication.*—Leaflets on use of super phosphate, sulphur against smut of jowar and 'Grow More Food' were published for information and guidance of the public.

C. *Agricultural Demonstration Centre*

During the year under report, only one Agricultural Demonstration Centre at Tansa worked and it was visited by about 500 cultivators.

P. C. MEHTA,
District Agricultural Officer,
Amreli.

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PROGRAMME OF WORK FOR THE YEAR 1950-51

Name.	Quantity to be distributed. Mds.	Area to be covered. Acres.	Expected additional yield. Tons
1. *Seed Schemes*—			
(*a*) Early selected jowar	75	600	10
(*b*) Niphad-4 wheat	2,700	3,600	60
(*c*) Pratap cotton	94	500	—
2. *Manure schemes*—			
(*a*) Manure mixture	160	1,280	90
(*b*) Sulphate of ammonia	150	560	40
(*c*) Superphosphate	15	210	15
(*d*) Groundnut cake	500	4,000	275
(*e*) Rural compost	5,000	5,000	275
(*f*) Town compost	2,500	1,250	40
(*g*) Farmyard manure	19,200	9,600	1,000
3. *Irrigation Schemes*—			
(*a*) New wells to be constructed.	1,120	5,442	972
(*b*) Old wells to be repaired	481		
4. *Extension of cultivation of other crops*—			
(*a*) Vegetables	—	200	
(*b*) Sweet potatoes	—	100	

P. C. MEHTA,
District Agricultural Officer,
Amreli.

APPENDIX XLIII

Summary of the Work done under the Agricultural Engineer to Government, B. S., Poona, for the year 1949-50.

A. *Staff and Administration*

The Section remained throughout the year in charge with Shri P. J. Patel, B.Ag., M.Sc. (Iowa), as Agricultural Engineer to Government.

The post of Assistant Agricultural Engineer (Expansion of Headquarter) was held by Shri C. K. Shah, B. E. (Elec. Mech.) till 30th September, 1949, and thereafter by Shri N. C. Shah, B.Sc. (Eng.), who was absorbed from the Ex-Baroda State.

Shri N. S. Soman, B. E. (Mech. and Elec.), held the post of Assistant Agricultural Engineer in charge Lift Irrigation

Scheme at headquarters and Shri P. P. Thakur held the post of Boring Engineer throughout the period under report.

The main activities conducted by the Section were as under:

(1) Lift Irrigation Schemes.

(2) Preparation of Plans and Estimates, etc. for Co-operative Lift Irrigation Schemes.

(3) Boring.

(4) Manufacture of the M. P. P. Boring Machines and their spares at the workshop.

(5) Manufacture of Winnowing Fans and other implements at the Workshop.

(6) (*a*) Mechanical Assistance to cultivators.

(*b*) Maintenance and repairs of existing pumping sets of departmental institutions and installation of new ones.

(7) Recommendations for supply of Tagai Loan, Petrol, etc., to cultivators.

(8) Water Finding.

(9) Conducting of oil engine class for Training in installation and maintenance of oil engines and pumps.

(10) Construction of new buildings for the Department as well as maintenance and repairs of old ones.

(11) Continuance of Well Scheme, Baroda, with a view to get completed incomplete wells.

B. *Lift Irrigation Scheme*

The four Divisional Offices at Anand, Broach, Sangli and Bagalkot continued their activities during this year. The irrigation programme (for the schemes which have been completed), has been planned by the District Agricultural Officers concerned and water charges are to be collected by the Collectors concerned.

(1) *Anand Division.*—Shri P. R. Joshipura, B.Sc. (Eng.), held the post of Assistant Agricultural Engineer in this Division. There were two Lift Irrigation sites under his control, viz., (*a*) Ratanpur in the Kaira district and (*b*) Miroli in the Ahmedabad district.

At Ratanpur, river Shedi went practically dry, with the result that a very little acreage could be irrigated during *rabi* and no acreage in hot weather. Efforts were made to divert the flow of Vatrak river in Shedi river, but to no success. The

commanded area at Ratnapur was 1,872 acres, of which, 35 acres were irrigated in *kharif*, 62 in *rabi* and nil in hot weather season.

At Miroli, a number of pumping plants were being worked on temporary basis in the scarcity days of the year 1948-49. It was decided to keep the erected pumping plants running during 1949-50 and supply irrigation water to the area there. Accordingly, water was supplied to 344 acres in *kharif*, 626 acres in *rabi* and 72 acres in hot weather seasons.

The plans and estimates for the mechanical portion of the bigger Lift Irrigation Scheme at Miroli commanding an area of about 4,000 acres, were under preparation.

(2) *Broach Division.*—Shri N. S. Soman, B. E. (Mech. and Elec.), held charge of the post of Assistant Agricultural Engineer in this Division till the 12th December, 1949, whereafter Shri C. K. Shah held the same till the end of the year. There were 7 Lift Irrigation Scheme sites under his control, viz., (1) Nikora, (2) Angareshwar, (3) Janor, (4) Kadod, (5) Titwa, (6) Umara, and (7) Manekpur.

The erection of machinery at Nikora was completed in November, 1949, and irrigation started thereafter. The commanded area at Nikora was 6,000 acres; the area irrigated during the *rabi* season was 73 acres, while no area was irrigated in *kharif* and hot weather seasons.

The engine houses at Angareshwar and Janor were not completed by the Civil Engineering Organisation till the 30th June, 1950, hence the erection of machinery at these sites could not be taken in hand before that date. The commanded area at each of these sites was 2,000 acres.

The erection of machinery at Kadod was completed in November, 1949, and irrigation started thereafter. The commanded area of this site was 4,000 acres; the area irrigated in the *kharif* and hot weather seasons was nil and in the *rabi* season was 30 acres.

The machinery at Titwa was erected in August, 1949, and the scheme started functioning from that date onwards. The commanded area at this site was 2,000 acres. The area irrigated in the *kharif* was 3 acres, in the rabi 47 acres and in the hot weather seasons nil.

The Ex-Baroda State Government had two Lift Irrigation Schemes at Umra and Manekpur functioning under their P. W. Department. These two schemes were taken over in June, 1950,

and are now functioning as Bombay Government Lift Irrigation Schemes.

(3) *Sangli Division.*—Shri K. V. Sahasrabudhe, B.E., held charge of the post of Assistant Agricultural Engineer in this Division till the 30th June, 1950, on which day the Division was closed on account of retrenchment. There were two sites under his control, viz., (1) Padmale in South Satara district, and (2) Ajansonda in the Sholapur district.

The irrigation work at Padmale was continued throughout the year. The commanded area at this site was 600 acres. In the *kharif* season, 18 acres were irrigated, in the *rabi* season 132 acres and in the hot weather season 60 acres. The work of this scheme would be looked after by the Assistant Agricultural Engineer in charge Lift Irrigation Scheme, Poona, after the 30th June, 1950.

The engine house construction at Ajansonda was not completed by the Civil Engineering Organisation before the 30th June, 1950; hence the engine and pump erection work could not be undertaken at this site, though all the machinery which was required was at this site for about 8 months. The work of this site would be looked after by the Assistant Agricultural Engineer in charge Lift Irrigation Scheme, Bagalkot.

(4) *Bagalkot Division.*—Shri R. S. Nadkarni, B.E., held charge of the post of Assistant Agricultural Engineer in charge Lift Irrigation Scheme in this Division. There were 7 sites under his control, viz., (1) Doddihal, (2) Rolli, (3) Baluti, (4) Haveri, (5) Anagwadi, (6) Korti, (7) Shivyogmandir.

The erection of machinery at Doddihal, Rolli and Baluti was completed in April, 1950, and the pumping stations at these sites were now in a position to supply irrigation water as soon as irrigation channels would be ready. The commanded areas at the three sites were 2,300, 1,200 and 1,600 acres, respectively.

The engine houses at Haveli and Anagwadi were not constructed by the Civil Engineering Organisation before the 30th June, 1950; hence the erection of machinery at those sites could not be taken up in hand. The commanded areas at those sites were 2,500 and 500 acres, respectively.

The irrigation work at Korti and Shivyogmandir was continued during the year and irrigation water was supplied to cultivators at both the sites. At Korti, the commanded area was 1,750 acres. In the *kharif* season, 196 acres were irrigated, in the *rabi* season 757 acres were irrigated, and in the hot weather

season 70 acres were irrigated. At Shivyogmandir, the commanded area was 1,200 acres. In *kharif* season, 63 acres were irrigated. In the *rabi* season 63 acres were irrigated and in hot weather season, 5 acres were irrigated.

(5) *General.*—The Government of Bombay have now decided that no more Lift Irrigation Schemes are to be undertaken. Hence, the surveys and estimates of additional Lift Irrigation Schemes are not being undertaken now.

(6) *Co-operative Lift Irrigation Scheme.*—The Government have now transferred the emphasis to the Co-operative Lift Irrigation Scheme with a view to encourage co-operative effort in this line. Proposals for 70 Co-operative Lift Irrigation Schemes were received from various Assistant Registrars working under the Co-operative Department. All these proposals were examined for feasibility, and feasibility certificates were issued to the deserving societies. The detailed Civil and Mechanical plans and estimates were under preparation in the offices of the various Executive Engineers in the Lift Irrigation Divisions and the Assistant Agricultural Engineers in the Lift Irrigation Scheme.

C. *Boring Section*

Now, 25 Ideco Power boring machines were purchased by Government and 24 New M. P. P. machines were constructed in the Agricultural Engineer's Workshop, Poona, in 1948, making total No. of machines 52 (25 Ideco, 24 New M. P. P. and 3 Old M. P. P.), which were put into operation from January, 1949, as per Government orders.

On account of the famine in 1949, 35 power boring machines were handed over to the District Local Boards and the Collectors of Gujarat to carry out the boring work in scarcity areas. The total number of boring machines actually working under the Agricultural Engineer to Government, were 19, including two Bucyrus Eric 22-W-Rig received due to the merger of the Baroda State. Further 24 M. P. P. machines were built in the Agricultural Engineer's Workshop and would be put into operation as soon as the necessary boring tools are received from the U. S. A.

After famine conditions were over, some boring machines were withdrawn from the District Local Boards. Actual number of boring machines working with the District Local Boards at present is 17.

The boring rates were revised. The cultivators were charged at half of the total estimated cost. According to these rates, all

transport charges and cost of pipes and other material was now borne by Department. For the work done through the District Local Boards, the District Local Boards were paid at scheduled full cost rates deducting charges of depreciation and interest on capital.

Boring Work done upto end of June, 1950, is as under:—

		No. of Bores	Total Footage.
Boring work done departmentally	...	106	9231'-6"
Work done by District Local Boards Ahmedabad and Kaira.	...	69	11331'-4"

As there was a great demand of boring work in the Baroda and Mehsana districts and as there was no sufficient number of power boring machines, some of the hand boring machines belonging to Baroda State were worked in these districts at the old Baroda rates by the Baroda staff at present shown in the Well Scheme, Baroda. The total footage done with hand boring sets in the Baroda and Mehsana districts was 9,798'-6".

The blansting work in Amreli was also continued for improvement of wells under the supervision of the District Rural Development Board. 209 wells were improved this way in the Amreli district during the year. The total receipts for boring work in the year were Rs. 94,297-9-0 only.

Manufacture of M. P. P. Boring Machines.—The work of manufacturing additional 24 M.P.P. boring machines undertaken in the year 1948-49 was completed during the year under report. The boring and fishing tools for these machines could not be procured due to want of import licence. These machines were lying in the Workshop ready for despatch. They will be put into service by the Boring Branch immediately the tools are made available. The necessary spare parts required for these machines are also manufactured.

A programme of manufacturing another lot of 24 M. P. P. Boring Machines has been taken at hand and the work is in full swing.

D. *Manufacture of Winnowing Fans and other Implements at the Workshop*

50 sweet potato slicing machines were manufactured. 25 of them were handed over to the Superintendent, Vegetable Development Scheme, Poona.

36 Winnowing fans and one wheat thresher were manufactured and supplied to the departmental institutions and cultivators.

E. *Mechanical Help to Cultivators*

During the year under report, numerous enquiries on various engineering problems were received and replied. Mechanical help was given to various departmental institutions and cultivators by the district as well as the Headquarters staff. The nature and other details of the mechanical help rendered to the cultivators are given below:—

S. No.	Items.	District Staff.					Head Qr. staff.	Total.
		Anand.	Broach.	Nasik.	Poona.	Bagalkot		
1	Sites surveyed.	28	9	26	72	20	...	155
2	Estimates prepared.	...	...	80	100	50	...	230
3	Erection carried out.	7	4	9	5	18	38	71
4	Repairs carried out.	32	5	19	...	42	50	148
5	Plants inspected.	31	1	19	...	52	...	103
6	Miscellaneous ...	...	...	...	...	3	17	20
7	Estimates of tagavi loans.	181	60	...	...	..	...	241
8	Recommendations for petrol.	34	45	...	...	2	...	81

Hire of Machinery.—The old machinery, such as engine, pump, boring machines, etc., were given on hire and the total receipts amounted to Rs. 1,086-13-0.

The receipts obtained from the mechanical help rendered to cultivators amounted to Rs. 846-4-0.

Numerous applications for recommendations of petrol for starting and running of the engines for agricultural purposes were received, which were scrutinised and forwarded, with due recommendations, to the Rationing Authorities concerned.

Many cultivators were recommended for tagai loans for the purchase and erection of engines and pumping plants meant for agricultural purposes.

F. *Water Finding*

Two Agricultural Officers in charge Water Finding Machines, were working in the Section. 114 applications from the public were received and 95 cases were dealt with including the

departmental sites. Two water finding machines were sold to the Administrator, Shirohi State. The total receipts realised from cultivators for examining their sites amounted to Rs. 1,265.

G. *Training in Installation and Maintenance of Oil Engines and Pumps*

The class for the training of the cultivators' sons in 'Installation and Maintenance' of the oil engines and pumps is being conducted every year. 101 candidates received education in the four sessions, conducted during the year at Poona.

Since January, 1950, the Registrar of Co-operative Societies, Bombay State, Poona, is sending candidates for this class for training drivers cum-Secretaries for Co-operative Irrigation Societies. 47 candidates sent by the Registrar of Co-operative Societies, were trained in this class up to the 30th June, 1950.

The students of the B.Sc. (Agri.) class from the College of Agriculture, Poona, were also given training in running of the oil engines and pumps as usual at Poona.

Another Oil Engine Class was started at Baroda temporarily from January, 1950, as facilities were available there. Only the candidates recommended by the Registrar of Co-operative Societies are at present trained. 39 candidates were trained up to the 30th June 1950.

It is observed that there is a great demand for this sort of training from all along the State. Proposals for opening regular Oil Engine Classes at Dharwar and Baroda to impart training in their regional languages are being prepared and will be submitted shortly.

H. *Construction of New Buildings for the Department as well as maintenance and repairs of the old ones*

Construction of new buildings for the Agricultural Schools at Dhulia and Bagalkot were started and the work of Puntamba was completed.

In all, different types of work amounting to Rs. 3,07,500 were carried out during the year at 20 different sites.

The estimates and plans for further 12 sites amounting to Rs. 1,48,000 were prepared and submitted for approval and sanction.

The plans and estimates for 24 Co-operative Societies were referred to this Section for scrutiny and all were attended to.

I. *Construction of Wells Scheme Ex-Baroda State*

The scheme started for the construction of wells by the Ex-Baroda State was continued. A construction programme of the wells taken with its progress is given below:—

Serial No.	District.	No. of wells taken on hand.	No. of wells completed with thalas.	No. of wells completed without thalas.	No. of well in progress.
1.	Baroda ...	110	64	30	16
2.	Mehsana ...	313	209	70	34
3.	Navasari ...	72	71	1	—
4.	Amreli ...	25	14	—	11
	Total ...	520	358	101	61

J. *General*

As the bulk of the work has increased considerably, the work of giving recommendations on petrol and tagavi loan demands, was also diverted to the Divisional Assistant Agricultural Engineers in charge of Lift Irrigation Schemes with a view to achieve the aim of quick disposals. The Mechanical Assistants were also placed under their direct control so that the local demand for mechanical help could be attended to promptly and correctly.

Need for having Assistant Agricultural Engineers on divisional basis to conduct all kinds of activities of this section in rural areas, was keenly felt.

N. C. SHAH,
Agricultural Engineer to Government,
B. S., Poona.

APPENDIX XLIV

Summary of the work done under the Mechanical Cultivation Engineer to Government, Bombay State, Poona, for the year 1949-50

A. *Staff and Administration*

Major R. S. Basrur held charge of the post of Mechanical Cultivation Engineer to Government during the period under report. Shri R. S. Tamhne, Foreman Supervisor, was appointed to officiate as Assistant Mechanical Cultivation Engineer in the B. A. S. Class II *vice* Shri S. A. Kothavale, from the 5th August, 1949.

During the year under report the Mechanical Cultivation Engineer was responsible for the mechanical cultivation, i. e., deep and shallow ploughing, harrowing, land clearance and levelling work of cultivators' lands by tractors, implements and bulldozers for eradication of deep-rooted weeds, for reclaiming cultivable waste lands and soil conservation work.

During the year under report, 101 tractors of 25 H. P. were added to the fleet of tractors. Besides this, 16 reconditioned bulldozers of 80 H. P. were purchased for this Section. This Section also received 14 tractors of 60 H. P. from the Government of India, against pending order. 6 tractors of the Baroda State were taken over by this Section, after merger of the State. Total number of tractors and bulldozers on the strength of this Section, at present are as follows:—

Caterpillar D7 tractors (including 22 bulldozers)	...	42
Caterpillar D6 tractors	...	6
Caterpillar D4 tractors (including 1 Bulldozer)	...	3
International Harvester TD18 Tractors (including 2 Bulldozers).	...	13
International Harvester TD14 Tractors (including 2 Bulldozers).	...	32
International Harvester TD 9 Tractor (Bulldozer).	...	1
Cletrac DD tractors	...	36
Cletrac BD tractors	...	7
Allis Chalmers HD10 tractors	...	4
Allis Chalmers HD7 tractors	...	6
Fordson Major tractors	...	3
Zetor-25 tractors	...	101

B. *Mechanical Cultivation*

(i) New tractor units were opened as under:—

(1) Indor (Land Reclaimation).

(2) Kolhapur.

(3) Sangli.

(4) Narayangaon (Poona District) (Soil Conservation).

(5) Kolaba.

(6) Panchmahals.

(7) Baroda.

For the present, there are 26 operational units, working in the State, as follows:—

Name of the District.	No. of units.	Name of the District.	No. of units.
1. Poona	2	11. Ahmedabad	1
2. Ahmednagar	2	12. Baroda	1
3. Dharwar	2	13. Panchmahals	1
4. Belgaum	2	14. West-Khandesh	1
5. Bijapur	2	15. East Khandesh	1
6. Kolhapur	1	16. Kolaba	1
7. Satara North	1	17. Thana	1
8. Broach	1	18. Satara South	1
9. Indoor (Kanara) (Reclaimation).	1	19. Nasik	1
		20. Sholapur	1
10. Surat	1	21. Kaira	1

2 Mobile Maintenance Sections at Dharwar and Kopargaon and one Central Workshop at Poona, look after repairs to tractors and implements.

(*ii*) Brief details of the work of the Mechanical Cultivation Section during the year under report are as under:—

Item.	Area in acres.	Rate per acre Rs.
Deep ploughing	29,705	22
Shallow Ploughing	40,675	14
Harrowing	10,933	6
Grading	17,644	14

The total revenue earned was Rs. 15,36,231 during this period and the total expenditure during the same was Rs. 15,11,359. The expenditure includes pay of staff, cost of oils, lubricants, etc., cost of spares and repairs and all administrative charges, but does not include interest and depreciation of the equipment used.

R. S. BASRUR,

Mechanical Cultivation Engineer to Government,
Bombay State, Poona.

Appendix XLV

Summary of the work done under the Soil Conservation Officer, Bombay State, Poona, for the year 1949-50

A. *Staff and Administration*

In accordance with the recommendations of the Administrative Enquiry Committee, Government in Government Resolution, Agriculture and Forests Department, Nos. 2474, dated 14th July, 1949, and 26th November, 1949, ordered that the Department of Agricultural Engineering should merge into the Agricultural Department, under the charge of a Joint Director of Agriculture (Engineering), as a result of which the Soil Conservation Section formed part of the Agricultural Department.

A notable event of the year was the merger of the Indian States, as a result of which the work done in some of the States e. g. Baroda and Kolhapur, was taken over by this Section and the staff engaged on Soil Conservation work in these States was merged in this Section.

In accordance with the provisions of the Bombay Land Improvement Schemes Act, Land Improvement Boards have been constituted for the remaining six districts shown below, thus compelling constitution of District Land Improvement Boards for the whole State:—

1. Baroda; 2. Mehasana; 3. Amreli; 4. Dangs; 5. Satara (south); 6. Kolhapur.

Shri Hari Singh held charge of the post of Soil Conservation Officer, throughout the year.

The Divisional Charges were held by:—

Division.	Name of Officer.	From.	To.
Northern Division	Shri R. B. Mutalik-Desai.	1-7-1949	12-7-1949
	Shri G. V. Patel ...	13-7-1949	30-6-1950
Central Division	Shri M. K. Shirole ...	1-7-1949	18-9-1949
	Shri M. S. V. Rama Rao...	8-7-1949	14-9-1949
	Shri K. D. Gumaste ...	1-7-1949	7-7-1949
	and again ...	15-9-1949	30-6-1950

Shri M. S. Wagle relinquished charge of the office of the Personal Assistant to the Soil Conservation Officer on the 31st July, 1949.

In view of the expansion of the work of the scheme for survey and classification of cultivable waste lands to the whole of Bombay State, including merged areas, the work under the above scheme was placed under the control of a Special Officer designated as Land Utilization Survey Officer and Shri M. K. Shirole was appointed to hold the above post. He worked as Land Utilization Survey Officer from the 19th July, 1949 to the 12th November, 1949, when he proceeded on deputation as Agricultural Officer, Hirakud Dam Project under the Central Government. The post is vacant since the 13th November, 1949, and Shri M. S. V. Rama Rao is holding charge of the post in addition to his own duties as Divisional Soil Conservation Officer, C. D., Poona, since the 13th November, 1949.

Shri R. V. Satpute, Sub-Divisional Soil Conservation Officer, Sholapur, was appointed to officiate as Technical Assistant to the Soil Conservation Officer, Poona, from the 23rd September, 1949.

Shri A. M. Pandya was appointed to officiate as Sub-Divisional Soil Conservation Officer, Dohad, *vice* Shri G. V. Patel, from the 10th September, 1949.

Shri B. K. Shinde was appointed to officiate as Sub-Divisional Soil Conservation Officer, Sholapur, *vice* Shri Satpute, from the 22nd September, 1949.

Shri Y. A. Joshi was appointed to officiate as Sub-Divisional Soil Conservation Officer, Pandharpur, *vice* Shri T. G. Yavgal, from the 31st July, 1949.

Shri N. K. Ghumare was appointed to officiate as Sub-Divisional Soil Conservation Officer, Ahmednagar, from the 28th September, 1949, *vice* Shri D. M. Kulkarni transferred as District Agricultural Officer, Jalgaon.

Shri H. V. Rajmane was appointed to officiate as Sub-Divisional Soil Conservation Officer, N. D., Bijapur, with effect from the 14th September, 1949, *vice* Shri K. D. Gumaste.

B. *Soil Conservation Work*

(A) *Large Scale Bunding.*—

(i) The work done during the year under report comprised of (*a*) Consolidation (i. e. further improvement) of work already executed, and (*b*) New bunding works. Details of the

work carried out under the above items both in respect of planning and execution of work in each district are as under:—

	Consolidation.		New Work.	
	Planning.	Construction	Planning	Construction
	A-G.	A-G.	A-G.	A-G.
1. Ahmedabad ...	—	—	604-00	—
2. Panch Mahals ...	—	—	3,534-00	91-00
3. West-Khandesh ...	—	—	466-00	294-00
4. East-Khandesh ...	—	—	435-00	372-00
5. Dangs ...	—	—	137-00	—
6. Nasik ...	—	—	2,001-00	336-00
7. Ahmednagar ...	7,583-00	7,460-00	4,556-00	2,068-00
8. Sholapur ...	12,272-00	12,288-00	16,329-00	2,148-00
9. Poona ...	2,233-00	1,958-00	2,979-00	820-00
10. Satara (North) ...	--	—	936-00	—
11. Satara (South) ...	1,708-00	1,908-00	2,612-00	147-00
12. Bijapur ...	8,911-00	12,554-00	8,338-00	235-00
13. Belgaum ...	2,487-00	2,875-00	4,681-00	282-00
14. Dharwar ...	2,867-00	1,427-00	7,769-00	146-00
Total ...	38,061-00	40,470-00	55,377-00	6,939-00

(*ii*) All bunding work was done in the past by engaging manual labour or bullock labour (keni work). But during the year under report, mechanical aid i. e. construction of bunds by bull-dozers, was availed of thus opening a new phase in the history of our struggle against soil erosion in the Bombay State.

(*iii*) Grass outlets are being tried in consolidation and new bunding works with a view to reduce cost on outlets and also with a view to see their utility in comparison with stone or pipe outlets.

(*iv*) *Water levels in the wells in the bunded areas.*—It is always said that the supply of water in the wells situated in the bunded areas has increased appreciably after the areas have been bunded. Many agriculturists support this statement. But there is no statistical data to prove the extent to which the water supply in the wells in such bunded areas has increased. Two catchments have, therefore, been selected in each Subdivision and water levels will be observed in the wells situated in these catchments thrice a year for four years to collect the necessary statistical data.

(B) *Small Scale Bunding.*—The question of taking up bunding of individual holdings was examined by Government and they came to the conclusion that it will not arise there most of the cultivators are keen on getting their lands bunded. As

however, large scale bunding it not likely for year to come to cover the whole State, Government decided that the Small Scale Bunding Scheme should be started, as an experimental measure, in the whole of the Sholapur district and in the scarcity area of the Poona district, for a period of one year, in the first instance. Extension of the scheme to other districts of the State will be considered by Government after the expiry of the sanctioned period of this scheme. Under this scheme individual owners having an area of 30 acres or more are given free technical advice. Subsidy at 50 per cent of the estimated cost subject to a maximum of Rs. 10 per acre is also paid if the works are carried out as per plans and estimates prepared by this Section.

Details of the work done under the above scheme during the year under report are as under:—

District.	No. of applications received.	Area (acres)	Area for which plans and estimates have been prepared. (acres)
Sholapur	65	3358-27	1990-19
Poona	19	812-25	417-31
Total	84	4171-12	2408-10

(C) *Percolation Tanks.*—Government ordered that the work of percolation tanks should be the responsibility of the Soil Conservation Section. Accordingly plans and estimates for a percolation tank at Nandgaon in the Belgaum district, the latter amounting to Rs. 1,00,238 were submitted to Government. Government have sanctioned this project with a remark that this work should be included in the programme of famine works.

Plans and estimates, the latter amounting to Rs. 68,287 have also been prepared for a percolation tank at Panache-Vadgaon in the Ahmednagar district and submitted to the Director of Agriculture.

Six more sites for percolation tanks in the districts of Nasik, Ahmednagar, Satara North and Sholapur are under investigation. These cases will now be forwarded to the Superintending Engineer, Deccan Irrigation Circle, Poona, in accordance with the recent orders of Government to transfer such works to the Public Works Department.

(D) *Flooding and reclamation Schemes.*—Plans and estimates to the tanks at Mangundi and Nagavi in the Dharwar district, originally prepared by the Public Works Department, were re-examined. A fresh survey had to be carried out at each of these two sites. Plans and estimates, the latter amounting to Rs. 66,965 in respect of Mangundi tank have been submitted to the Director of Agriculture and the plans and estimates in respect of Nagavi tank are under preparation and will be submitted shortly.

(E) *Bunding in the Dangs district.*—At the request of the District Rural Development Board, Dangs, the services of one Field Assistant from the Soil Conservation Section are placed at the disposal of the District Agricultural Officer, Dangs, for giving advice to the cultivators in the Dangs for constructing bunds in their fields.

(F) *Bunding in Bhal tract.*—Government in Government Resolution, Agriculture and Forests Department No. 3363, dated 15th July, 1949, have sanctioned a scheme for bunding fields and repairing the existing bunds in the Bhal tract in the Ahmedabad district. Under this scheme, the cultivators are granted tagai loans up to Rs. 20 per acre at the rate of interest of 3½ per cent for bunding their fields. 25 per cent of the tagai loan, limited to Rs. 5 per acre is written off as subsidy on the production of a certificate from the Soil Conservation Section that the field bunds have been satisfactorily completed.

(G) *Afforestation.*—No new afforestation works were taken up during the year under report. Wherever regeneration in the areas previously afforested has been successful, steps were taken to maintain these.

(H) *Grass-land Improvement.*—The following six sites have been selected for carrying out experimental work on the improvement of grass-lands in an area of 10 acres at each place:—

Name of site.	Taluka.	District.
1. Karoli	Tasgaon	Satara South
2. Jogeshwarwadi	Karjat	Ahmednagar
3. Pennur	Mohol	Sholapur
4. Davagiri	Haveri	Dharwar
5. Kerimallapur	Ranebennur	Dharwar
6. Asundi	Gadag	Dharwar

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(I) *Plane Table Survey Work.*—The work of Plane Table Survey of the remaining area of 23,309 acres as shown below out of the areas bunded previously was completed:—

Sub No.	Sub-Division.	Area surveyed by plane table from 1-7-1949 to 30-6-1950.
1.	Bagalkot	54 acres
2.	Bijapur W. D.	13,448 „
3.	Belgaum	6,741 „
4.	Satara	846 „
5.	Sholapur	1,220 „
	Total	23,309 acres

C. *Training*

(*i*) 32 Agricultural Graduates who were selected for appointment in the Soil Conservation Section were given training for 3 weeks in the Soil Conservation technique (theory and practice), accounts work and Survey and Classification of waste lands.

(*ii*) A batch of 6 Land Assistants was sent to the Economic Botanist to Government, B. S., Poona, for training in grass-land improvement.

D. *Record of Rights and Liabilities under the Bombay Land Improvement Scheme Act*

(*i*) *Draft schemes in respect of bunding works already done*—During the year under report, the District Land Improvement Boards approved draft schemes in respect of 143 villages (in which land improvement works were carried out prior to the receipt of Government orders on the report of the Land Improvement Inquiry Committee), under Section 5 (*1*) of the Land Improvement Schemes Act, and the schemes have been published in the Bombay Government Gazettee under Section 5 (*2*) of the Act. Further action for getting these schemes sanctioned by the District Land Improvement Boards under Section 9 (*1*) of the Act has also been taken.

(*ii*) *Recovery Statements in respect of bunding works already done.*—According to the orders contained in Government Resolution, Agriculture and Rural Development Department, No. 806, dated the 5th June, 1948, recovery of the cultivators' or owners' share of cost of bunding work is to be effected at the rate of Rs. 9 per acre in 12 equal annual instalments, without interest, commencing one year after the completion of the consolidation of the works already done. For this purpose, recovery

statements are to be prepared as per Section 13 (*1*) of the Land Improvement Schemes Act for the areas of which the consolidation work has been completed. During the year under report, 51 recovery statements were prepared in respect of 11,230 acres and 33 gunthas and sent to the Mamlatdars concerned for effecting recovery after entering the same in the Record of Rights under Section 13 (*2*) of the Land Improvement Schemes Act. The total amount to be recovered comes to Rs. 86,718-1-6, the annual instalment to be recovered being Rs. 7,037-8-0.

(*iii*) *Draft Schemes in respect of new bunding works.*—114 draft schemes covering an area of 32,869 and 12½ gunthas were prepared under section 5 (*2*) of the Land Improvement Scheme Act and submitted to the District Land Improvement Board concerned for sanction. Of these, 91 schemes covering an area of 25,432 acres and 35½ gunthas were sanctioned by the Boards concerned under section 9 (*1*) and published in the Bombay Government Gazette under Section 9 (*2*) of the Land Improvement Scheme Act.

(*iv*) *Recovery statements in respect of new bunding works.*—According to Government orders contained in Government Resolution, Agriculture and Rural Development Department, No. 806, dated the 5th June, 1948, the recovery of the cultivators' or owners' share of the cost of bunding work carried out under the new scheme is to be effected in 15 equal annual instalments, free of interest, commencing one year after the completion of the work. As the new works are started only this year, the question of preparing recovery statements will be taken up in due course.

E. *Propaganda and Publicity*

This section took part in the agricultural shows and exhibitions held at Bombay, Poona, Nagar, Satara, Tasgaon, Mahud, etc., where models and posters pertaining to soil conservation work were exhibited. As a result of the propaganda carried out by the staff of this section, about 4,74,000 acres were offered for new bunding till the close of the year under report. The staff of this section also attended the Village Workers' Training Classes organised by the Rural Development Boards and gave lectures explaining the importance of soil conservation work in rural agriculture.

An important event of the year was the preparation of the film on "Soil Conservation". The staff of this section took

great pains in assisting Shri E. R. Cooper, who has been entrusted with the work of preparing the film by the Director of Publicity. The outdoor work has been completed and the film is nearing completion. The film, when ready, will remove a long-felt need of exhibiting on the screen the importance of soil conservation work in Indian Agriculture.

F. *Survey and Classification of Cultivable Waste Lands*

The scheme for survey and classification of cultivable waste lands which was originally sanctioned in Government Resolution, Agriculture and Rural Development Department No. 1828, dated the 11th June, 1948, for a period of nine months and extended up to the 31st December, 1949, has been further extended up to the 28th February, 1951, as per orders issued in Government Resolution, Agriculture and Forests Department, No. 1828, dated the 30th November, 1949.

In addition to the work of Survey and Classification of Government waste lands in villages having compact blocks of waste lands of 100 acres and over, the staff has also been entrusted with the work of survey and classification of lands given out for cultivation on eksali lease by the Revenue Department in villages other than those referred to above as per orders issued in Government Circular, Agriculture and Rural Development Department, No. 3095-I, dated the 14th March, 1949. An area of 5,18,227 acres was inspected in 905 villages, but of which, an area of 1,85,906 acres was found fit for cultivation. Schemes in respect of 566 villages were submitted to Government till the close of the year and Government orders in respect of 526 schemes have so far been received.

As regards survey and classification of lands given out for cultivation on eksali lease in villages other than those referred to in the foregoing paragraph, an area aggregating 96,746 acres was inspected in 257 villages, of which, an area of 38,235 acres was found fit for cultivation.

The following special colonization schemes were also prepared and submitted to Government:—

(1) Colonization Scheme for waste lands in Sorpada Block of Rajpipla State for settling Adivasis.

(2) Colonization Scheme for settlement of Katkaris at Akloli, Thana District.

(3) Scheme for settlement of displaced persons on waste lands in Banaskantha District.

(4) Scheme for bringing more lands under cultivation in Waghodia taluka, Baroda District.

G. *General*

As a result of the propaganda carried out by this section, it is evident that there is genuine demand for soil conservation work from all over the State. The cultivators have become much more soil conservation-minded than ever before. We are not, however, able to do so much work as we would like to do due to scarcity of labour.

With a view to extending the activities of this section over the whole of the Bombay State, including merged areas, proposals for the re-organization of the Divisional and Sub-Divisional Soil Conservation Officers' charges were submitted to Government. They have ordered that the proposals regarding creation of additional Sub-Divisions should be renewed in October next.

HARI SINGH,
Soil Conservation Officer,
State of Bombay, Poona.

PROGRAMME OF WORK FOR THE YEAR 1950-51

I. *Soil Conservation.*—The work of consolidation, i. e., further improvement of the areas already bunded and bunding of new areas will continue. It is proposed to prepare plans and estimates for 40,000 acres and 60,000 acres in case of consolidation and new works, respectively. 35,000 acres will be consolidated and 30,000 acres will be bunded.

II. *Survey and classification of waste lands in the State of Bombay.*—The work of survey and classification of Government waste lands in villages having compact blocks of waste lands of 100 acres or over and of the lands given out for cultition on eksali lease by the Revenue Department in villages other than those referred to above, will be continued. This work will be carried out over an area of approximately 2,50,000 acres under the former and 27,500 acres under the latter item.

HARI SINGH,
Soil Conservation Officer,
State of Bombay, Poona.